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Supplement 75

Diseases of Plants in the United States in 1929

June 15, 1930

BUREAU OF
PLANT INDUSTRY
UNITED STATES DEPARTMENT OF AGRICULTURE

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DISEASES OF PLANTS IN THE UNITED STATES IN 1929.

Prepared by

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Plant Disease Reporter
Supplement 75

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INTRODUCTION

The summary of plant diseases in the United States in 1929 differs from those of other years both in size and in content. The earlier summaries occupied several separate Supplements of the Plant Disease Reporter, whereas this one is short enough to be contained in one. Previous compilations included the major part of the data collected during the year. In them were reported practically all of the hosts and diseases concerning which information was received, all facts about each disease were considered, collaborators were quoted rather extensively, and in some instances the literature was reviewed and a rather complete bibliography for the year given.

In the present summary, however, only what appear to be the newer, more important, and outstanding facts are featured. New diseases, new hosts, significant deviations from normal prevalence of the common and important diseases, and losses, are emphasized. Quotations and the bibliography are reduced to a minimum.

Practically all of the important information received by the Survey during the growing season of 1929 has been published from time to time in the Plant Disease Reporter, volume 13, 1929. In the present summary these data have therefore been omitted, but in connection with each disease the references to volume 13 of the Reporter are given at the end of the discussion, e.g. P.D.R. pages 56,

86. Other references are listed in the bibliography at the end of the summary, and are indicated in the text by figures in parentheses.

In preparing this summary it has been the intention of the compilers to make the statements for each disease as brief as is consistent with bringing out the essential facts. Therefore, it has been necessary, in most cases, to omit the names of the persons who have contributed the information. Emphasis has been placed on disease distribution and losses. Control measures and varietal susceptibility have not been stressed.

This summary is made possible by the continued cooperation of collaborators of the Plant Disease Survey, whose names and addresses follow. It is very largely a result of their contributions. Considerable information has also been supplied by members of various offices in the Bureau of Plant Industry, located both in Washington and in the field. It is especially desired to thank the Offices of Cereal Crops and Diseases, Horticultural Crops and Diseases, Forage Crops, Sugar Plants, Forest Pathology, Blister Rust Control, Nematology, and Barberry Eradication for furnishing information and for reviewing the sections of this report coming within the field of their activities.

LIST OF COLLABORATORS FOR THE YEAR 1929

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P. O. Long Beach - D. J. Crowley.

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HAITI, Service Technique, Port au Prince - H. D. Barker.

CUBA, Central Baragua, Baragua, Province De Camaguey - J. A. Faris.

PHILIPPINE ISLANDS, Bureau of Science, Manila - C. J. Humphrey.

PORTO RICO, Insular Experiment Station, Rio Piedras - *M. T. Cook, J. A. B. Nolla.

WEATHER CONDITIONS

The following brief statement of the outstanding weather conditions affecting crops during the growing season of 1929 is taken from the Weekly Weather and Crop Bulletin of the United States Department of Agriculture, for the week ending January 14, 1930.

> "During the growing season there were two outstanding adverse conditions with regard to rainfall. Too much moisture was harmful in the early spring in most central valley sections and greatly delayed the planting of corn; later in the season, especially during the latter part of July and in August, many sections had damaging drought. This latter was most severe between the Mississippi River and Rocky Mountains, but was generally widespread in character, and, as a result, spring-planted crops were rather widely damaged. The fall, however, was unusually favorable for maturing late crops, without widespread, serious damage from frost.
>
> "Winter wheat largely escaped the drought, as it had mostly matured, but spring wheat was caught rather badly, with resulting damage. In the late summer and fall there was considerable delay in the preparation of the soil and the seeding of winter wheat, because of dry weather, but opportune rains and the late fall were favorable and the crop got a good start before the winter set in, except in the dry areas of the far West.
>
> "In the Cotton Belt temperatures during the summer were mostly moderate, and rather uniform from week to week, but there were two outstanding unfavorable aspects with regard to precipitation. In the east heavy rains during the fall months interfered with picking and damaged open staple, and a severe drought in the west the latter part of the season was unfavorable for the growth and development of cotton, but

favored holding the boll weevil in check."

A summary for the fall season of 1929 - September to November, inclusive, taken from the December 17, 1929, issue of the same periodical, shows that the outstanding features were the generous to excessive precipitation over large areas east of the Rocky Mountains, and the very large deficiencies west of them. Quoting further:

> "From the Ohio Valley eastward and southward, except locally in the Southeast, the amount of rainfall for the 3-month period was mostly from 150 to as high as 300 per cent of the normal for the season, while nearly all sections between the Mississippi River and Rocky Mountains show excesses, locally amounting to 200 per cent. Between these areas there is charted a belt of somewhat less than the normal amount, and moderate deficiencies appear in the northeast. West of the Rocky Mountains it was one of the driest falls of record, with the percentage of normal precipitation ranging from zero to only 50 per cent over nearly all of the area, and with most of it having less than 25 per cent of the normal amount."

DISEASES OF CEREAL CROPS

WHEAT

STINKING SMUTS (*Tilletia laevis* and *T. tritici*). These smuts (*T. laevis* in the East and the Great Plains area; *T. tritici* chiefly in the Northwest and on the Pacific Coast) continued destructive in 1929. In general, however, the losses (see table 1) were probably lower for the country as a whole than they have been for the last three or four seasons. The epiphytotic of recent years in the Middle Atlantic States continued to subside. For instance, in Pennsylvania stinking smut was approximately one-half as destructive as in 1928, and slightly more than one-fourth as destructive as in 1927. In Kansas, where an outbreak occurred during the period 1924 to 1926, seed treatment has gradually reduced stinking smut until the losses this year averaged about 3 per cent for the State, and these were mostly in non-Farm Bureau Counties where seed treatment has not been urged. From Colorado comes the report that practically every farmer treats his seed with copper carbonate, and the losses were estimated at only 0.2 per cent as compared with 8 per cent in 1926. In California copper carbonate is almost universally used, and seems to have held the losses for the State down to about 0.5 per cent.

One of the outstanding features in connection with this disease has been its increase in durum wheat during the past few years. Ten years ago only from one to 2 per cent of the cars of hard red spring and durum wheat received at Minneapolis graded smutty, but during the last five years there has been a decided growth in the percentage of smutty cars, to about 14 per cent in 1928 and 11.5 per cent for the months of September and October, 1929. It is becoming evident that this increase is due to the spread of specialized physiologic forms of the fungus.

P.D.R. pages 56, 86, 87, 123, 168, 169, 170.

Table 1. Losses from stinking smut of wheat as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
6	Idaho	1	Texas
5	Washington	.5	Delaware, Indiana, California
4	Maryland, North Carolina	.4	Wisconsin
3	Virginia, Nebraska, Kansas, Oregon	.2	Colorado
2	Pennsylvania	Trace	West Virginia, Illinois, Michigan, Iowa, Missouri, Arkansas
1.5	Ohio, Minnesota, North Dakota, Montana		

LOOSE SMUT (Ustilago tritici). The usual situation appeared to exist as far as this disease was concerned, the loss for the country being about average which is slightly over one per cent. Notable exceptions were Missouri, North Dakota and Kansas. In Missouri it was said to have been one of the worst years for loose smut, the estimated losses averaging 4 per cent. In North Dakota favorable weather for infection in 1928 resulted in increased amounts - about 2.5 per cent and as high as 10 per cent was observed in some fields. In Kansas it was more prevalent than usual, especially in the northeastern part, but the losses did not average over a trace for the State as a whole. Field observations in Pennsylvania showed that the varieties Leap and Forward continued to be resistant. Percentage losses are given in table 2.

P.D.R. pages 56, 67, 105, 123.

Table 2. Losses from loose smut of wheat as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
4	Missouri	.5	Maryland, Indiana, Idaho
2.5	Virginia, North Dakota	.1	Montana
1.8	Pennsylvania	Trace	Delaware, South Carolina, Wisconsin, Minnesota, Kansas, Colorado, Washington, Oregon, California
1.5	North Carolina		
1	Texas, Ohio, Iowa		
.7	Illinois		

FLAG SMUT (Urocystis tritici). Figure 1 shows the known geographic distribution of flag smut in the United States as reported up to the present time. In 1929 the Illinois State Department of Agriculture examined a total of 66 fields in areas of Illinois where flag smut has occurred in the past. These fields were located in four counties, as follows: Madison 11, St. Clair 23, Jersey 27, and Logan 5. No flag smut was found. In 1921 inspections in the same areas in Madison County showed 60 per cent infested fields, and in St. Clair County 42 per cent. Since 1921 there have been several winters during which wheat has been killed and consequently flag smut reduced - infected plants being more susceptible to winter killing than uninfected.

No inspections were made and no reports were received from the other two states in which this disease was formerly reported, namely, Missouri and Kansas. Plans are being made for an inspection of these areas in 1930.

P.D.R. pages 29, 168.

STEM RUST (Puccinia graminis tritici). 1929 cannot be considered a stem rust year, as the damage for the country as a whole was comparatively slight. The disease was not so serious as in 1927 but more so than in 1928 when the losses were considerably less than usual. In Minnesota and in parts of North and South Dakota, where the disease is usually most serious, stem rust and drought damage together caused rather heavy losses. A 15 per cent loss was estimated for Minnesota. In northeastern South Dakota losses to spring wheat other than durum in sixteen counties averaged 8 to 10 per cent, but for the State as a whole only 4.14 per cent for these wheats and 3 per cent for all wheat was estimated. The loss for North Dakota was estimated at one per cent as compared with 0.5 per cent in 1928 and 10 per cent in 1927. As will be noted from table 3 the only other states estimating one per cent or more were Ohio with 1.5 per cent, Wisconsin with 4.5 per cent, and Kansas with one per cent. A noteworthy feature of the year was unusual prevalence in some of the Eastern States where stem rust is ordinarily of slight importance. In Pennsylvania it was found in 51 of the 121 fields surveyed. In North Carolina 0.5 per cent loss was estimated as compared with a trace for the three previous years. In parts of Georgia stem rust was said to be very serious, while several very heavy local epiphytotics were reported from Texas. In Kansas, owing to the unusually moist season, the disease was more prevalent than it has been for several years, but infection came very late and the rust did damage only in the central part of the State.

P.D.R. pages 24, 30, 56, 68, 69, 84, 171.

Table 3. Losses from stem rust of wheat as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
15	Minnesota	.5	Pennsylvania, Virginia, North Carolina, Texas, Indiana, Illinois
4.5	Wisconsin		
3	South Dakota	.3	Iowa
1.5	Ohio	Trace	Massachusetts, Maryland, South Carolina, Michigan, Missouri, Nebraska, Arkansas, Montana, Wyoming, Colorado, Idaho, Washington, California
1	North Dakota, Kansas		

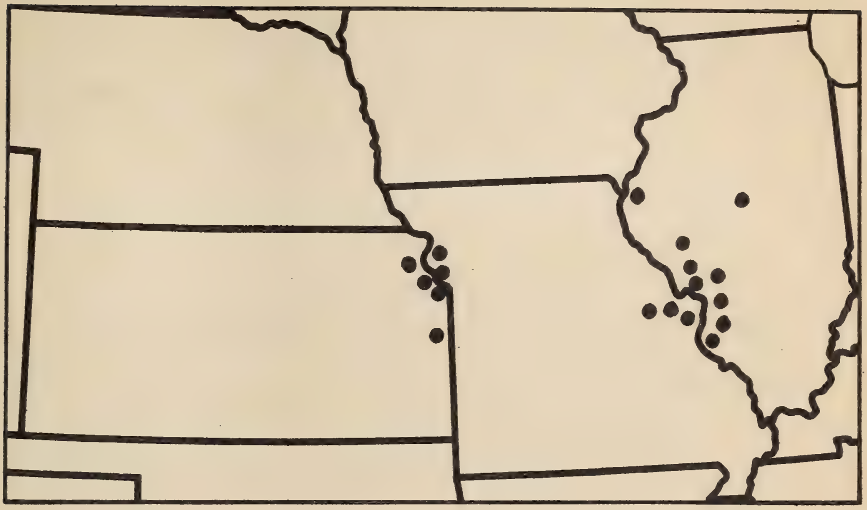


Figure 1. Known distribution of flag smut of wheat in the United States. Each dot represents a county from which the disease has been reported at some time in the past. No flag smut was reported in 1929.

Counties in which flag smut has been found:

Illinois

Madison
St. Clair
Monroe
Jersey
Macoupin
Greene
Scott
Logan
Hancock

Missouri

St. Louis
St. Charles
Warren
Platte
Buchanan

Kansas

Leavenworth
Atchison
Wyandotte
Miami

LEAF RUST (Puccinia triticina). In prevalence leaf rust was somewhat above the average, more than usual being reported from the majority of the eastern winter-wheat States where it is usually most important. In the Northwest and in California, however, much less than normal occurred, apparently on account of dry weather. Estimated percentages of loss are given in table 4.

In Pennsylvania the most destructive leaf rust epiphytotic of recent years was reported. It became general several weeks earlier than usual and by heading time there was 70 to 100 per cent leaf and considerable stem infection. Leaves were killed two weeks earlier than normal resulting in a general shriveling of the grain and lowering of the test weight. The loss for the State was estimated at 15 per cent or from 4 to 8 bushels per acre.

P.D.R. pages 23, 31, 56, 68, 69, 85.

Table 4. Losses from leaf rust of wheat as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
15	Pennsylvania	1	Michigan, Missouri
8	Iowa	.5	Maryland, Texas, Ohio, Illinois, Minnesota
4	Indiana		
3.5	North Carolina	Trace	Delaware, North Dakota, Nebraska, Arkansas, Montana, Colorado, Idaho, Washington Oregon, California
3	Virginia, South Carolina, Kansas		
1.5	Wisconsin		

SCAB (Gibberella saubinetii). In 1928 scab caused considerable damage in the northern tier of eastern wheat States, including the spring wheat area, but in 1929 the area of greatest prevalence was farther south and west, centering in the central Mississippi Valley. The soft red winter wheat States of the Atlantic Coast largely escaped serious damage.

Kansas experienced the most severe outbreak in years. Scab is normally of very slight importance in that State but in 1929 many fields in the eastern half showed 25 per cent infected heads, while 40 to 50 per cent was not unusual. The average loss for eastern Kansas was placed at 10 per cent, and for the entire State at 2 per cent. With Kansas producing some 138,000,000 bushels of wheat this loss would approach 3,000,000 bushels. Extremely wet and unseasonable weather of June was thought to be responsible for this outbreak as well as for the unusual prevalence of certain other diseases.

In Arkansas the disease was much more prevalent than ever noted before. As much as 2 per cent loss occurred in certain fields. In Missouri, where weather conditions were similar to those in Kansas, serious infection also occurred, but relatively late in the season owing to the rather low temperatures of the spring months. From Nebraska the first report since 1923 was received. See also report by Dickson under barley (page 15). Estimated percentages of loss are given in table 5.

P.D.R. pages 56, 68, 85, 86, 122.

Table 5. Losses from wheat scab as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
4	Missouri	1	Ohio, North Dakota
3	Indiana	.5	Pennsylvania, North Carolina, Texas, Wisconsin, Minnesota
2.5	Illinois		
2	Virginia, Kansas	.4	Iowa
1.5	Maryland, Michigan	Trace	Delaware, South Carolina, Arkansas

ANTHRACNOSE (Colletotrichum graminicolum). Anthracnose again caused a decided reduction in yield and shriveled grain in many Pennsylvania fields. It was said to be present in nearly every field. The estimated loss for the State was one per cent. It was said to be prevalent in Illinois but caused only a trace of damage. In Indiana a loss of 0.5 per cent was estimated. It was unusually prevalent and injurious in eastern and southeastern South Dakota.
P.D.R. pages 56, 68, 85.

GLUME BLOTCH (Septoria nodorum). Losses from this disease were estimated as follows: 2 per cent, Pennsylvania and Maryland; 0.5 per cent, Indiana; 0.2 per cent, Missouri; trace, Illinois.
P.D.R. pages 56, 85.

SPECKLED LEAF BLOTCH (Septoria tritici). This disease assumed epidemic proportions in Texas, Oklahoma, Kansas, and in parts of Missouri and Iowa. In Kansas and Oklahoma many fields of hard red winter wheat were practically defoliated long before maturity, resulting in light-weight grain. In Missouri the principal outbreak was in the lowlands of the southeastern part of the State, where many plants were entirely killed or at least so badly damaged early in the season as to seriously stunt them. Losses were estimated as follows: 1 per cent, Indiana and Kansas; 0.5 per cent, Illinois; trace, Pennsylvania, Missouri, and Iowa.
P.D.R. pages 24, 31, 56, 86.

BLACK CHAFF (Bacterium translucens undulosum). This disease, suspected of having been introduced with wheat from Russia some thirty or more years ago, was reported in 1929 as occurring to a very slight extent in Illinois, Wisconsin, Minnesota, Iowa, Nebraska, Kansas, Montana, and Idaho. The only two states reporting it as of any particular importance were North Dakota with an estimate of 0.25 per cent loss, and Kansas, where it appeared late but caused rather serious losses in the central part just before harvest.
P.D.R. page 86.

HELMINTHOSPORIUM FOOT ROT (Helminthosporium sativum and other organisms). One of the most widely prevalent and certainly one of the most destructive diseases of wheat in Minnesota, North Dakota, and South Dakota, in 1929, (moreso in 1928) was that complex roughly classified as "foot rot", but due largely to

Helminthosporium sativum. In my opinion, foot rot causes annually more damage than does stem rust. (H. B. Humphrey)

In portions of Hale and Castro Counties, Texas, in Canadian, Kingfisher and Garfield Counties, Oklahoma, and in Sumner County, Kansas, this foot rot of wheat was very destructive. In some cases losses as high as 90 per cent of the crop occurred. (Summarized by A. G. Johnson from a report by Hurley Fellows)

TAKE-ALL (*Ophiobolus graminis*). Six areas two to five feet in diameter were found in a wheat field at Bowers, Berks County, Pennsylvania, on June 27, to be infested with take-all. Typical perithecia and ascospores were found. This is the first report of this disease in Pennsylvania. (R. S. Kirby)

Take-all occurred with considerable severity in portions of Grant, Garfield and Kingfisher Counties in Oklahoma; and in the following counties of Kansas: Pottawatomie, Riley, Geary, Dickinson, Saline, McPherson, Rice, Reno, Stafford, Kingman, Harper, Sumner, Sedgwick, Harvey, Marion, and Morris. In some of these counties the disease was very destructive on a number of farms. (Summarized by A. G. Johnson from a report by Hurley Fellows).

P.D.R. page 85.

SCLEROTIUM BLIGHT (*Typhula graminum*). First reported to the Survey as occurring in the United States in 1922 from Idaho. Since then it has been reported also from Washington and Montana. It is capable of causing considerable damage locally to winter wheat, killing out large patches or sometimes entire fields, early in the season. In 1929 it was reported as occurring locally in Montana and Idaho. In Gallatin County, Montana, it was serious in some fields with estimated losses as follows:

100 per cent	- 80 acres	30 per cent	- 80 acres
95 "	- 80 "	25 "	- 100 "
75 "	- 5 "	15 "	- 145 "
50 "	- 230 "	10 "	- 140 "

P.D.R. 23, 70.

CRINKLE-JOINT (undet.) Considerable damage reported in North Dakota and Kansas. In this disease the straw breaks over between nodes, causing a type of lodging, growth is then resumed resulting in a right-angled bend in the straw at the first node above the break. The heads formed on this straw are usually poorly filled or empty. The exact cause is not known. Farmers have attributed it to hail but it often occurs in the absence of hail. In Kansas some fields showed 4 to 5 per cent of the culms affected in this manner and the reduction in yield for the State is estimated at 1 per cent.

P.D.R. pages 56, 86.

BASAL GLUME ROT (*Bacterium atrofaciens*). P.D.R. pages 56, 86.

ERGOT (*Claviceps purpurea*). P.D.R. page 87.

FOOT ROT (*Helminthosporium* spp.) P.D.R. pages 23, 69, 87.

NEMATODE (*Tylenchus tritici*). P.D.R. page 105.

POWDERY MILDEW (*Erysiphe graminis*). P.D.R. pages 22, 86.

ROOT ROT (?) P.D.R. page 31.

RYE

STEM RUST (*Puccinia graminis*). Was generally reported as of the usual slight importance or less, all states reporting only a trace of loss.
P.D.R. page 171.

LEAF RUST (Puccinia dispersa). Seemed to be somewhat above the average in prevalence. Losses reported were: 3 per cent in Pennsylvania, 1 per cent in Virginia, South Carolina (includes also leaf rust), Ohio, and Kansas, 0.5 per cent in Indiana, traces in other states reporting.
P.D.R. page 68.

ANTHRACNOSE (*Colletotrichum graminicolum*). Was reported from Pennsylvania (loss 2 per cent), North and South Carolina, Indiana (loss 1 per cent), Illinois, and Wisconsin.
P.D.R. page 68.

ERGOT (*Claviceps purpurea*). Losses reported: 2 per cent in Wisconsin, 1 per cent in Indiana and Minnesota, 0.1 per cent in Ohio, traces in Pennsylvania, Iowa, and North Dakota.

LEAF SPOT (*Septoria secalis*). Ten to 25 per cent infection of the leaves in fields observed in Iowa. (R. H. Porter)

SCAB (*Gibberella saubinetii*). Was reported in the area from Pennsylvania south to North Carolina and west to Iowa and Wisconsin. Ohio, Indiana, and Michigan reported more than usual; in the other states there was apparently about the average amount. Losses of more than a trace reported were: 3 per cent in Virginia, 2 per cent in Ohio, 1 per cent in Indiana and Michigan.
See reports on scab of wheat and barley for further information.

BARLEY

COVERED SMUT (*Ustilago hordei*) and LOOSE SMUT (*U. nuda*). These two smuts are always present and in the aggregate cause a very great loss. There is nothing in the 1929 reports to indicate much variation from normal conditions, although

Table 6. Losses from covered smut of barley as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	Maryland	1	Texas, Indiana, North Dakota
3	Pennsylvania, Virginia, Oregon	.5	Ohio, Minnesota, Idaho
2.5	North Carolina, Kansas	Trace	Massachusetts, Wisconsin, Iowa, Nebraska, Colorado, Washington, California
2	Montana		

covered smut was only reported more prevalent than usual from Pennsylvania, Maryland, and Kansas, while loose smut was reported more prevalent than usual from the majority of the Upper Mississippi and the Ohio Valley States. In Virginia one field of five acres was observed where these smuts together were affecting 60 per cent of the heads. Estimated losses are given in tables 6 and 7.

Table 7. Losses from loose smut of barley as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
6	North Carolina	0.5	Ohio, Indiana, Idaho
4	Pennsylvania	Trace	Massachusetts, Delaware, Missouri, Nebraska, Colorado, Oregon, California
2.7	Illinois		
1.5	Iowa		
1	Maryland, Virginia, Texas, Wisconsin, Minnesota, North Dakota, Kansas, Montana		

P.D.R. pages 23, 33, 63, 104, 107, 123, 169, 171.

STEM RUST (Puccinia graminis). P.D.R. pages 104, 106, 123, 171.

Table 8. Losses from stem rust of barley as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
4	Minnesota	Trace	Pennsylvania, Maryland, Indiana, Wisconsin, North Dakota, Colorado, Oregon, California
1	Ohio		
.5	Iowa		

LEAF RUST (Puccinia anomala). About the average conditions seemed to prevail with respect to this disease, although in Pennsylvania the heaviest infection ever recorded was reported and in Idaho it was noted for the first time in recent years on the experimental plots. Iowa and Kansas also reported more than average prevalence, although in neither state was the loss more than a trace.

P.D.R. pages 32, 106.

Table 9. Losses from leaf rust of barley as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
2	Pennsylvania	Trace	Massachusetts, Maryland, Virginia, Illinois, Wisconsin, Minnesota, Missouri, Oregon, California
1	Texas, Ohio		
.5	Indiana		

STRIPE (*Helminthosporium gramineum*). This is one of the most important of the barley diseases and there are some indications that it is becoming more so, at least in certain sections. Last year collaborators in Kansas reported it as apparently becoming increasingly serious, especially in the northwestern part of the State. In Iowa some fields showed 30 per cent of the plants killed. More than the normal amounts were reported from Pennsylvania, Indiana, Iowa, and Kansas. Other states reported about the usual amount. In California it seemed to be present in the usual quantity, namely, from a trace to 5 or 6 per cent, and the dry season apparently had no effect whatever on the amount of disease to be found in the fields. Losses are given in table 10.

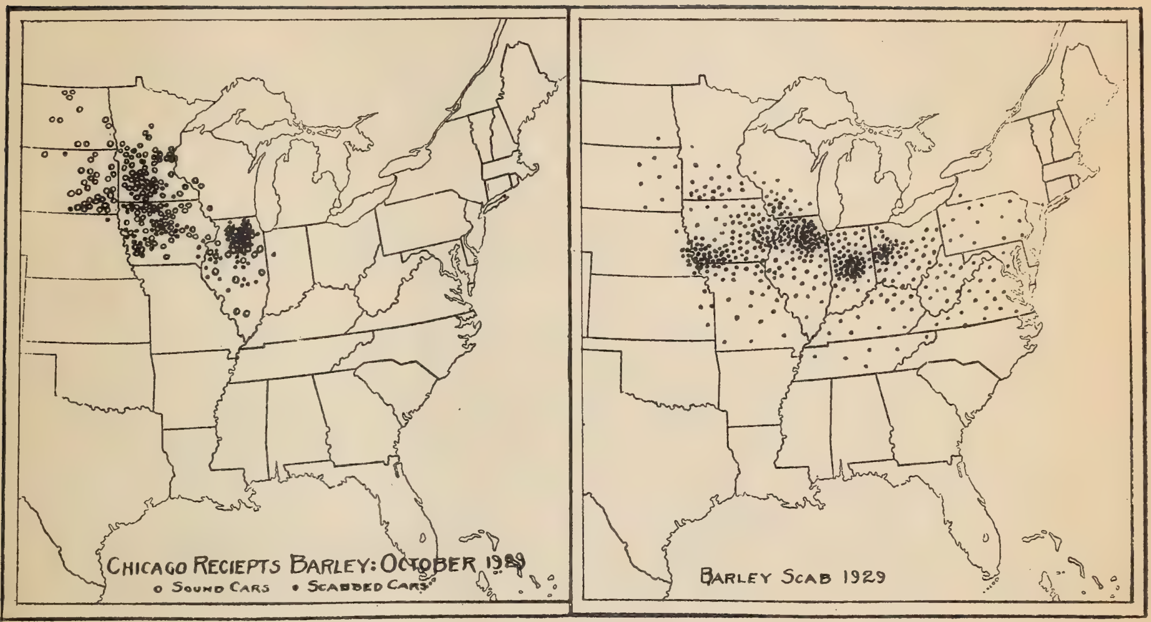
P.D.R. pages 32, 68, 104, 106, 107, 123, 169.

Table 10. Losses from barley stripe as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
6.7	Illinois	1	Virginia, Minnesota, Montana
5	Iowa	.7	North Dakota
3	California	.5	Michigan
2.5	South Carolina	Trace	Delaware, Maryland, Indiana, Colorado, Idaho, Washington, Oregon
2	Texas		
1.7	Pennsylvania		
1.5	Wisconsin, Kansas		

RUSTY BLOTCH (*Helminthosporium californicum*). This disease, originally reported from California in 1923 and not known to occur outside of that State, was reported by Mackie in 1929 as causing much injury in many fields, by attacking the upper leaves of the plants especially. Rusty blotch seems to be more destructive on plants suffering from drought conditions, such as prevailed last year, or other unfavorable factors. As usual it appeared late in the season, about the time the heads begin to exsert.

P.D.R. page 32.


CHICAGO RECIEPTS BARLEY: OCTOBER 1929
○ SOUND CARS ● SCABBED CARS
BARLEY SCAB 1929

A. Origins of cars of barley graded sound or scabby on the Chicago market for October, 1929.

B. Distribution according to 1929 field survey by Office of Cereal Crops and Diseases. Each dot represents an infested field.

Figure 2. Occurrence of barley scab. (Maps supplied by J. G. Dickson).

SCALD (Rhynchosporium secalis). Scald, which ordinarily is the most destructive cereal disease in California and which was especially injurious in 1928, was conspicuous by its absence in most areas in 1929. (W. W. Mackie)

ERGOT (Claviceps purpurea). One German variety showing about 25 per cent ergot was observed in Iowa.

P.D.R. page 107.

DOWNY MILDEW (Sclerospora macrospora). This fungus was reported for the first time on barley in this country by W. W. Mackie (41) from Kings County, California. The specimens were collected June 21, 1929. On wheat it has been reported from Tennessee and Kentucky and from this same county in California, but never before on barley.

SCAB (Gibberella saubinetii). The following report and the maps reproduced in figure 2 have been contributed by J. G. Dickson, Office of Cereal Crops and Diseases.

Scab infection on both barley and wheat was much less prevalent than in 1928 but appeared in amounts of economic importance in more or less localized areas. Sections in Virginia and part of West Virginia reported damage on both winter wheat and winter barley; local areas in Ohio and Indiana were severely damaged by scab, especially areas where barley was grown on corn land. Northern Illinois and southwestern Wisconsin were severely damaged where barley was grown on disked corn land. In this area, damage was fully as severe as in the general epidemic on barley the previous year. The scab epidemic of commercial importance during the past season occurred through Iowa, Missouri, and westward into Nebraska, Kansas, and Oklahoma. Most of the scabbed barley causing trouble in the grain trade was shipped from this area early in the season. In general, however, much less scab occurred and over a more localized area in the South Central United States.

P.D.R. pages 68, 88, 104, 107, 123.

NET BLOTCH (Helminthosporium teres). P.D.R. pages 106, 107.

POWDERY MILDEW (Erysiphe graminis). P.D.R. pages 22, 107.

SPOT BLOTCH (Helminthosporium sativum). P.D.R. pages 32, 106, 107.

OATS

SMUTS (Ustilago avenae and U. levis). These smuts, which are generally distributed with the crop, were common as usual, causing more or less damage in the different areas depending on weather conditions and the extent of seed treatment. In Missouri infection was said to be the worst in ten years. In North Carolina fall-sown oats especially were affected, while in Arkansas spring-sown oats showed from 15 to 20 per cent smut. In Kansas, where smut was very prevalent this year, it seems to be increasingly apparent that they are dealing with more than one physiologic form. According to C. O. Johnston the physiologic form which attacks Fulghum and Kanota is spreading rapidly northward and westward. Kanota fields as far north as Manhattan showed considerable smut. The combined losses from these two smuts are given in table 11.

P.D.R. pages 54, 68, 105, 106, 128, 168, 169, 170, 171.

Table 11. Losses from loose and covered smuts of oats as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
11	Missouri	4	Virginia, Ohio, Iowa
10	Pennsylvania	3	Indiana
9	North Carolina	2	Wisconsin, North Dakota, Arkansas, Texas
8	Massachusetts		
6.5	Illinois	1.5	South Carolina, Mississippi, Idaho
6	Minnesota, Montana	1	Louisiana, Washington
5.2	Kansas	.1	Colorado
5	Maine, Maryland, Florida, Oregon	Trace	Delaware, Michigan, Nebraska

STEM RUST (Puccinia graminis). Only in the states north of the Ohio and Missouri Valleys was any particular damage reported. From Pennsylvania westward to Iowa only a trace to 0.7 per cent loss was estimated. In Michigan, Wisconsin, and Minnesota, however, the damage was greater. Some fields in the lower counties of the northern peninsula of Michigan suffered 15 per cent loss, and 6.7 per cent and 3 per cent were estimated for Wisconsin and Minnesota respectively. In general the disease came late in the season and oats in the areas usually affected largely escaped. (Table 12)

P.D.R. pages 105, 106, 123, 171.

Table 12. Losses from stem rust of oats as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
3	Minnesota	Trace	Massachusetts, Maryland, Virginia, Indiana, Illinois, Iowa, Missouri, North Dakota, Nebraska, Kansas, Colorado, Idaho, Washington, Oregon, California
1	Michigan, Wisconsin		
.5	Pennsylvania, Ohio, Texas		

CROWN RUST (Puccinia coronata). Seemed to be of about the average prevalence in 1929, ten states reporting it as of the usual importance, four as less prevalent than normal, and five as more prevalent. As usual the highest percentages of loss reported occurred in the South. In Wisconsin crown rust was said to be most severe in the proximity of Rhamnus bushes, whereas in Kansas no infection could be found on R. cathartica at Manhattan and infection was

apparently all from a uredinial source. In Kansas infection developed late but became very heavy before the crop ripened and susceptible varieties dried up prematurely. (Table 13).
P.D.R. pages 33, 54, 68, 87, 105, 106, 128.

Table 13. Losses from crown rust of oats as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
40	Florida	.5	Maryland
10	Louisiana	.2	Ohio
5	South Carolina	Trace	Maine, Massachusetts, Delaware, Illinois, Michigan, Minnesota, North Dakota, Nebraska, Arkansas, Washington, Oregon, California
3	Kansas, Texas		
2	Wisconsin, Iowa		
1.5	Mississippi		
1	Pennsylvania, Indiana, Missouri		

BLAST (undet.) Reported to be on the decrease in Kansas and California, due to the replacing of white oats by resistant red oats such as Kanota. As usual, blast was one of the two most serious diseases of oats in Illinois, causing a reduction in yield estimated at 3 per cent.
P.D.R. pages 33, 68, 105, 106.

ERGOT (Claviceps purpurea). P.D.R. page 106.

HALO BLIGHT (Bacterium coronafaciens). P.D.R. page 106.

CORN

SMUT (Ustilago zeae). In prevalence smut was about normal, although an unusual amount of ear infection was reported from Connecticut, Pennsylvania, Ohio, and Iowa. In Mississippi and Arkansas it was noted as being especially prevalent in some of the overflowed river valleys where corn was planted late. Sweet corn was mentioned as being injured in Michigan, especially the early varieties, and in Minnesota. (Table 14).
P.D.R. pages 54, 107, 123, 124.

Table 14. Losses from corn smut as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
5	Ohio, Iowa, Nebraska	1	New York, South Carolina, Mississippi, Arkansas
3	Pennsylvania, Virginia, Kansas	.5	New Jersey, Delaware, Missouri, Louisiana, Texas
2.5	Florida		
2	North Carolina, Minnesota, North Dakota	.3	Maryland, Indiana
1.5	Massachusetts, Wisconsin	Trace	Montana, Colorado, Idaho, Washington, Oregon, California

DRY ROT (*Diplodia zeae*). Losses from dry rot were reported as follows: 7 per cent, Iowa; 3 per cent, Florida; 2 per cent, Ohio and Missouri; 1.5 per cent, Indiana; 1 per cent, Maryland and Kansas. In Florida the losses are complicated by other species of Diplodia. It was estimated that two other species caused 2.5 per cent loss. In Missouri it was thought that the early spring weather was too cool, and in Kansas it was reported that July and September were too dry for development. In both of these states the disease was less prevalent than usual.

ROOT ROTS and EAR ROTS (caused by various fungi). *Gibberella saubinetii*, *Pythium* sp., and *Fusarium* spp. were mentioned as being associated with or causing root or stalk rots. Estimated losses are given in tables 15 and 16. The root rot situation still remains very complicated, and it is desirable that investigators of this problem attempt to discover and evaluate the importance of the causes more exactly. From the disease survey standpoint it would be helpful if the various diseases here concerned, including ear rot, could be separated out on the basis of symptoms, and without respect to cause. If that were done we might have something like the following: root rot, seedling blight, and ear rot.

In general the 1929 season did not seem to be especially favorable for development of these troubles, as only South Carolina out of eighteen states reporting mentioned them as more prevalent than usual.

B. Koehler of Illinois has figured the percentages of ear rot occurring in the various rotations on the University Farm as follows:

	1929	1928
Diplodia zeae	2.84	1.98
Fusarium moniliforme	1.54	3.08
Basisporium gallarum	0.54	0.25
Gibberella saubinetii	0.12	0.02

P.D.R. pages 108, 124.

Table 15. Losses from root rot of corn as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
9	Maryland	1	Wisconsin, Minnesota, Texas
5	West Virginia, South Carolina, Louisiana	.5	Delaware, Ohio
4	Florida, Mississippi	Trace	Missouri, Kansas, Montana, Idaho, Oregon, California
3	Virginia, North Carolina		
2	Pennsylvania, Indiana		

Table 16. Losses from corn ear rots as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
8.5	Iowa	2	Ohio, Missouri, Texas
6.5	Florida	1	Maryland, West Virginia, Wisconsin, Nebraska, Kansas
5	Louisiana		
4	Pennsylvania	.5	Delaware
3	Virginia, Mississippi	.4	Minnesota
2.5	North Carolina	Trace	Oregon, California
2.1	Indiana		

COB ROT (Basisporium gallarum). This was unusually prevalent in Iowa, not only shriveling the ears but also being present in the butts of ears which appeared normal in weight. Iowa corn for 1930 seeding is carrying an abundance of infection. A loss of 5 per cent, including reduction in yield and loss in quality after harvest, was estimated for Iowa. The disease was also reported from Indiana (estimated loss 0.5 per cent), and Kansas.

BACTERIAL WILT (Aplanobacter stewartii). Reported from Massachusetts, New York, New Jersey, Maryland, West Virginia, Ohio, Indiana, Illinois, and Michigan. In New Jersey where 3 per cent loss was estimated, and where some growers lost heavily, concerted efforts are being made to obtain disease-free seed for the 1930 crop. Near Morgantown, West Virginia, fields of sweet corn, planted with seed from New York, and Longfellow field corn, with seed from Connecticut, showed severe damage. One field was reported in Saginaw County, Michigan, where the crop of early sweet corn was an entire loss.
P.D.R. page 124.

BROWN SPOT (*Physoderma zeae-maydis*). This disease, southern in its range, was reported from North Carolina, South Carolina, Florida, Mississippi, Louisiana, Arkansas, Missouri, and Kansas. Somewhat more than usual was mentioned as occurring in North Carolina and Louisiana, but less than usual in Missouri and Kansas. In Florida the loss was estimated at 5 per cent, with infection running as high as 70 to 90 per cent in some fields continuously cropped to corn. Other losses were: Mississippi, 3; Louisiana, 2.5; and North Carolina, 0.5 per cent.
P.D.R. pages 54, 70, 123.

RUST (*Puccinia sorghi*). For the country generally there was less rust than usual, probably on account of the dry summer and early fall. More than usual was noted on upland field corn in the vicinity of Athens, Georgia, however, and more than normal on sweet corn in Wisconsin. The loss for the country did not exceed a trace.
P.D.R. pages 54, 107.

LEAF BLIGHT (*Helminthosporium turcicum*). A very severe outbreak appeared in Florida after the corn had tasseled. In several fields 40 per cent of the plants had some or all of their leaves prematurely killed. (A. H. Eddins)
P.D.R. pages 54, 126.

FALSE SMUT (*Ustilaginoidea virens*). Reported (26) from Louisiana (1925) and the Canal Zone (1926). It causes excrescences on the tassels somewhat resembling common smut.

DOWNY MILDEW (*Sclerospora graminicola*). Weston (68) has just reported occurrence on young Golden Bantam sweet corn near Sturgeon Bay, Wisconsin, in the summer of 1921. It did not spread further on corn that summer, nor did it reappear on that host there in 1922 and 1923. The only other state from which this disease has been reported on corn is Iowa.

MOSAIC (virus). Has been reported only from Georgia, Louisiana, Mississippi, and Arkansas. Was said to be much less prevalent in southwestern Louisiana than usual.

FLAX

Wilt (*Fusarium lini*). Reported in Kansas for the first time last year, was reported again in 1929. From 5 to 10 per cent occurred in one variety on the experimental plots at Rest, and slight amounts were observed also in commercial fields. North Dakota estimated 5.5 per cent loss and about the average prevalence.

RUST (*Melampsora lini*). Was reported from Oregon for the first time in 1924, and in 1926 it was feared that it might prove a very serious handicap to the fibre-flax industry in that State. It is interesting to note that in 1929 much less than normal occurred. In the southern part of the State the damage was slight in a few fields. In the remainder of the State there was practically no damage. Minnesota reported 3 per cent loss, Iowa 1 per cent, and North Dakota a trace.

PASMO (Phlyctaena linicola). This disease, apparently introduced from South America, was first noted in North Dakota about 1916, and since has been found in South Dakota, Minnesota, Wisconsin, and Michigan. In 1929 it was collected in Kansas for the first time, where it was found by A. C. Dillman in experimental plots at Rest, Wilson County, July 2.

HEAT CANKER (non-par.) P.D.R. page 70.

SORGHUM

COVERED KERNEL SMUT (Sphacelotheca sorghi). Three physiologic forms of this smut are now recognized in Kansas. Melchers, Ficke, and Johnston (44), using eighty varieties, selections, and hybrids, isolated the three forms as follows: Form 1 does not attack milo, hegari, and feterita. Form 2 attacks milo and hegari, but not feterita. Form 3 attacks feterita and certain feterita hybrids, but not milo. An estimated loss of 3 per cent was reported from Kansas in 1929. The damage was greatest in the western part of the state where no seed treatment campaign has been conducted.

DISEASES OF FORAGE CROPS

ALFALFA

BACTERIAL WILT (Aplanobacter insidiosum). Seems to be the most serious disease of alfalfa and continued destructive in 1929. A loss of 25 per cent was estimated in Iowa. In Missouri it is becoming widespread and, associated with other root troubles, is causing marked damage. Four per cent loss was estimated. In Kansas 150,000 acres had to be plowed up or abandoned apparently due chiefly to wilt. Old stands are being destroyed and new ones are difficult to establish. In Nebraska it can be found in varying amounts in all alfalfa sections. More damage was reported from Idaho this year, wilt being found generally distributed in the Snake River Valley from Twin Falls to the Oregon line. During the year it was reported for the first time from Oregon, where it caused serious reduction in stand in several fields. In California it is one of the outstanding troubles of alfalfa and is quite prevalent and destructive in parts of the San Joaquin Valley, from Bakersfield to Modesto, where it limits the life of the stand to from three to four years.
P.D.R. pages 70, 108, 129, 166.

ROOT ROT (Phymatotrichum omnivorum). Kills entire fields in Cameron and Hidalgo Counties in Texas. Taubenhaus and Dana estimate 40 per cent loss for the entire state.
P.D.R. page 108.

WINTER INJURY. A great deal of damage occurs from winter injury annually. In Many cases it is so closely associated with bacterial wilt and root rots that it is impossible to make a reliable diagnosis. Several collaborators suggest that winter-injured plants are more likely to be attacked by the root-rot producing organisms. In Iowa last winter the snow cover afforded excellent protection so that the crop came through the winter in good condition. Farther south

in Missouri, however, more damage, estimated at 5 per cent, occurred. In eastern Oregon injury was severe, resulting in thin and dwarfed stands.
P.D.R. page 70.

STEM ROT (Sclerotinia trifoliorum). Reported from Missouri for the first time (Pl. Dis. Reptr. 13: 22. 1929) in five fields in the southeastern part of the state. It has probably been present there for some time, but not strikingly evident until this season. It was also commonly reported from parts of western Washington and Oregon.

RUST (Uromyces medicaginis). Was very prevalent in southern California in the autumn. In some fields 75 per cent of the leaves were attacked and stem lesions were abundant.
P.D.R. pages 159, 166.

YELLOWS (due to leafhoppers). Very severe on the second cutting in New Jersey. In some fields nearly every leaf was yellow, the plants stunted, and the crop hardly worth harvesting. In Virginia it is thought to be annually increasing in importance.
P.D.R. pages 88, 166.

GIRDLE (Undet.) A specimen of this disease, first described by Brown and Gibson from Arizona (9), was collected near Little Rock, Arkansas, August 8, by J. G. Horsfall. This is the first report of girdle from that State. Weimer reports a girdle caused by leafhopper as being quite abundant but not of importance in southern California.
P.D.R. page 129, 166.

A BLACK STEM DISEASE (Undet., probably of fungous origin) of alfalfa, sweet clover, and red clover has been under observation in Kentucky during the past seven years (65). Under certain conditions it apparently has caused serious loss to each of the crops mentioned.

ALBINO (undet.) P.D.R. page 159.

ANTHRACNOSE (Colletotrichum trifolii). P.D.R. page 166.

BACTERIAL BLIGHT (Bacterium medicaginis). P.D.R. pages 159, 166.

DOWNY MILDEW (Peronospora trifoliorum). P.D.R. pages 10, 108, 159, 166.

LEAF SPOT (Pleosphaerulina briosiana). P.D.R. page 22.

LEAF SPOT (Pseudopeziza medicaginis). P.D.R. page 159.

WHITE SPOT (non-par.) P.D.R. page 159.

YELLOW LEAF BLOTCH (Pyrenopeziza medicaginis). P.D.R. pages 159, 166.

SWEET CLOVER

BLACK STEM DISEASE (see also under alfalfa). Appears to be the most widespread and destructive disease of sweet clover, according to the Office of Forage Crops and Diseases.

COWPEA

SCAB (Cladosporium vignae). Georgia is now added to the States of occurrence, namely, Alabama, Arkansas, Indiana, Delaware, and Virginia. O. C. Boyd first collected it in the middle part of the State near Albany by June 7. Later it was found in two places in the southern part. Central Georgia growers reported considerable loss. The determination was verified by M. W. Gardner.

WILT (Fusarium sp.) A loss of 5 per cent was reported from California, where the disease was said to be prevalent and severe in many fields in the San Joaquin Valley and in Los Angeles and Orange Counties. Fusarium wilts were reported also from Virginia, Texas (F. tracheiphilum), and Mississippi (F. martii).

SOYBEAN

DOWNY MILDEW (Peronospora manshurica (P. sojae, P. trifoliorum manshurica). This is a relatively new disease in the United States. It was probably introduced from the Orient, where it occurs in Manchuria, Siberia, Formosa, India, and the Philippines. In this country it was first noted in North Carolina in 1923. In 1924 it was collected in Delaware and Kentucky, in 1925 in Alabama, Mississippi, and Louisiana, in 1927 in Virginia, and in 1928 in West Virginia, Georgia, Ohio, and Indiana. Four new states reported its occurrence in 1929, including Massachusetts, New Jersey, Illinois, and Missouri. The Missouri specimen was collected in the fall of 1928 on the experiment station grounds at Columbia but was not definitely determined until 1929. In Massachusetts the disease was first found on Illini soybeans from Illinois-grown seed in the experiment station plots, and later spread to several other varieties (Pl. Dis. Reptr. 13: 129. 1929). Downy mildew had not been reported from Illinois but a special investigation determined its occurrence also in that State (Pl. Dis. Reptr. 13: 159-160. 1929).

VETCH

STEM ROT (Sclerotinia sp.) H. P. Barss reports a very severe attack in Oregon on Vicia monantha and considerable on V. earvillea, the former on ground where the same species was grown last year. A little had shown up before. Lodging followed by warm, wet weather appears to have been exceedingly favorable.

KUDZU

HALO BLIGHT (Bacterium medicaginis phaseolicola (B. puerariae). Was present as usual in most of the plantings in Georgia but caused less damage than it ordinarily does according to O. C. Boyd.

Miss Hedges (27) reports that Bacterium puerariae Hedges is identical with B. medicaginis phaseolicola Burkh. On the kudzu vine it is known to occur in Connecticut, Georgia, Florida, and Indiana.

LEAF BLIGHT (Rhizoctonia sp. ?) This thread blight disease of petioles and leaflets seems to be on the increase in distribution and severity in Georgia. It causes more defoliation than bacterial halo blight. It caused at least 10 per cent defoliation in one Grady County field this year. The loss for the state is estimated at 0.5 per cent. (O. C. Boyd)

DISEASES OF FRUIT AND NUT CROPS

APPLE

SCAB (Venturia inaequalis). 1929 is recorded as a bad scab year. In general cool, wet spring weather favored an abundance of early infection, and although dry weather in the summer tended to retard secondary infections, still rainy periods were frequent enough to cause spread and this, but more especially the damage caused earlier in the season, resulted in heavy loss. In some of the eastern states it was one of the worst scab years on record. The increased prevalence extended to states beyond the Mississippi River. Kansas reported considerably more than normal, and in Nebraska it was the worst in fifteen years. Estimated losses are given in table 17.

Nine states reported observations on ascospore discharge. This method of observing the development of the fungus, so that definite spray recommendations based on the actual facts can be made, is being depended on more and more to supplement the spray schedule in the apple sections where scab is important.

P.D.R. pages 4, 12, 34, 48, 64, 78, 100, 112, 133, 145, 153.
P.D.R. 14, No. 7, pages 56-61. Apr. 1, 1930.

Table 17. Losses from apple scab as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
25	Ohio	5	Massachusetts, West Virginia, Missouri, Arkansas
18	Wisconsin		
16	Michigan	4	Maine, Virginia
12	Iowa	3	Maryland, Kansas
10	Georgia	2	North Dakota
8	Indiana	1.5	Delaware
7	Oregon	0.5	Mississippi, Montana
6	North Carolina		

BLOTCH (Phyllosticta solitaria). Indiana, Illinois, and Kansas reported more blotch than usual. In most of the other states where blotch occurs it was of about average prevalence. Among the items of interest is the report of the disease on seedling trees in the Clarke County State Forest in Indiana. It was found at Wapato, Yakima County, Washington, on nursery stock shipped from the East. In Virginia, where there was less than usual, infection on unsprayed trees of Northwestern Greening was 47 per cent as compared with 60 to 80 per cent on the same trees in previous years. (Losses in table 18).

P.D.R. pages 36, 48, 78, 101, 153.

Table 18. Losses from blotch of apple as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
5	Missouri	1	West Virginia, Ohio, Texas
3.5	North Carolina	.5	Maryland
3	Kansas, Mississippi	.3	New Jersey
2	Indiana, Arkansas		

RUST (Gymnosporangium juniperi-virginianae). In general, rainy spring weather favored exudation of the telial horns and infection of apple foliage. In Indiana, Missouri, Kansas, and Nebraska considerably more damage was reported than usual. In Missouri, rust was one of the most serious apple diseases, affecting both foliage and fruit. Nebraska experienced the most severe and widely distributed epiphytotic in ten years. Excellent results from cedar eradication were reported from Virginia, and in one district in Iowa an eradication campaign has resulted in the destruction of 75 per cent of the cedar trees. (See also quince rust on apple). (Losses in table 19).

P.D.R. pages 7, 16, 36, 49, 100, 133.

Table 19. Losses from rust of apple as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
6	Kansas	1.5	Massachusetts, Indiana
2.5	Virginia	.5	Maryland, Mississippi
2	North Carolina, Missouri	.1	Ohio

QUINCE RUST (Gymnosporangium germinale). An outstanding feature of the cedar rust situation in 1929 was the unusual number of reports of the quince rust affecting apple fruit. The significance of this rust on apples has been pointed out by Thomas and Mills (63) in New York. In 1929 there was less than last year on New York apples of susceptible varieties, but it caused damage in Indiana, Tennessee, and West Virginia. The unusual severity of rust on the

Winesap variety in Kansas leads to the suspicion that this rust might also have been the one concerned there, but unfortunately sufficient material was not available for microscopic examination to determine this point.

In Indiana, Miller and Gardner reported much more than usual, probably infecting about 1 per cent of the fruit. In one commercial orchard of Winesap 20 per cent fruit infection was observed. It caused widespread concern because of its severity on Delicious, which is supposed to be resistant to rust. Other varieties affected were: Stayman, Jonathan, Baldwin, Grimes, Winter Banana, and Rome. In 1924 this same rust was found on the variety Gideon in southern Indiana.

In Tennessee, it was prevalent in a commercial orchard near Jackson where the fruit of the varieties Delicious, Stayman, and Winesap were affected, while the leaves were comparatively free. Difficulty was experienced in getting a specimen that would show the aecial stage of the fungus, but finally one was obtained which checked with G. germinale. In West Virginia quince rust was found on Rome Beauty fruit in Mineral County.

P.D.R. pages 7, 36.

BLACK ROT (Physalospora malorum). The leaf spot symptom of this disease was commonly reported, especially in neglected orchards, from eastern apple sections. The most defoliation and damage apparently occurred in the Appalachian section from Maryland southward to northern Georgia, and in the Missouri, Arkansas, and Kansas area. The canker was rated as more important in Missouri, and in Michigan and Virginia fruit rot was especially mentioned. In the latter state it was correlated with unusually heavy codling moth infestation. (Losses in table 20).

P.D.R. pages 17, 36, 79, 100, 153.

Table 20. Losses from black rot of apple as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
5	Maryland	1.3	Virginia
3	South Carolina	1	Kansas
2	North Carolina	.5	Indiana, Michigan, Mississippi
1.5	Missouri		
		.2	Ohio

BITTER ROT (Glomerella cingulata). Reported from the usual range, in most cases as less prevalent or at least not more prevalent than usual. In North Carolina, however, it was favored by the wet season, and was said by R. F. Poole to be more severe than it had been during the past four years. Heavy losses occurred throughout the State, even in the mountain areas where the disease is usually controlled by natural conditions. Only partial control was obtained with Bordeaux mixture and calcium sulfide on the College farm. In Missouri, according to I. T. Scott, bitter rot was particularly severe in commercial orchards in the Missouri River counties. (Losses in table 21).

P.D.R. pages 79, 101, 113, 153.

Table 21. Losses from bitter rot of apple as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	South Carolina	1	Maryland, Arkansas
5	Georgia, Mississippi	.5	Virginia
3	North Carolina, Missouri	.2	Ohio

BLIGHT (Bacillus amylovorus). Especially the blossom blight symptom was unusually prevalent in the Atlantic Coast States from Delaware to Georgia, and in most of the states northwestward to Minnesota. Twig infection later in the season was more prominent in Michigan and Wisconsin. Reporters mentioned that wet cool weather, accompanied by a prolonged blossoming period, favored infection and advance in susceptible varieties. In Virginia the first heavy blossom infection in seven years was reported. In some Grimes orchards infection amounted to as much as 60 to 100 per cent. In West Virginia a considerable amount of collar blight of Grimes Golden trees, most of which developed in 1928, was observed in a few orchards. One orchard showed 75 per cent of the trees infected with 20 to 25 per cent completely girdled. In North Carolina advance of the organism into the trunks during 1929 was reported commonly. In several commercial orchards in Raben County, Georgia, blossom blight completely ruined the crop. (Losses in table 22).

P.D.R. pages 6, 15, 35, 50, 64, 112.

Table 22. Losses from blight of apple as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	Georgia, Iowa	1	Maryland, South Carolina, Michigan, Oregon
5	North Carolina, North Dakota, Mississippi, Texas	.5	Delaware, Virginia, Ohio, Wisconsin
2	Missouri	.1	Indiana

SOOTY BLOTCH (Gloeodes pomigena). This disease is one of the most important in Virginia on all varieties. Cessation of spraying on July 1 and poor pruning are important factors in its development. It caused a 4.5 per cent reduction in grade. (F. J. Schneiderhan)

FRUIT SPOT (Cylindrosporium pomi). Was again prevalent and the cause of considerable damage especially on Grimes and other susceptible varieties, particularly in the lower Hudson Valley of New York, southeastern Pennsylvania, New Jersey, Delaware, Maryland, Virginia, and West Virginia. It seems to be increasingly probable that reduced spraying late in the season to avoid the arsenical residue problem is largely responsible for the increased loss from this disease in eastern states during recent years.

P.D.R. page 36.

BLISTER SPOT (Pseudomonas papulans). This organism was described by Rose (51) in 1917 as the cause of a fruit spot of apples in Missouri. Apparently there have been no authentic reports of its occurrence since. In 1929, M. W. Gardner however reported abundant infection of green Rome apples in the University orchard at Lafayette, Indiana. All lesions examined microscopically showed bacterial ooze.

FRUIT SPOT AND SURFACE ROT due to a strain of Sporotrichum malorum Kidd & Beaumont was reported on stored fruit from southern Indiana by Gardner (20). It was first noticed in 1925.

PERENNIAL CANKER (Gloeosporium perennans). The most serious and widespread disease affecting apple trees in Hood River and adjacent valleys at the present time. (Childs (13).

Table 23. Distribution of perennial canker and apple tree anthracnose in the Pacific Northwest. Prepared by E. V. Shear; data from records of Cooley and Childs.

	Anthracnose	Perennial canker
Oregon:		
Medford District	**	*
Willamette District	***	*
Hood River District	***	***
Mosier District	*	***
The Dalles	-	*
Mill Creek (Section of the Dalles)	-	***
Dufur	-	**
Stanfield	-	**
Milton-Freewater	-	*
Imbler-LaGrande	-	-
Washington:		
Underwood - White Salmon (Across from Hood River)	***	***
Spokane	-	***
Yakima	-	*
Wenatchee	-	**
Walla Walla - Dayton	-	***
Idaho:		
Lewiston	-	*

* means disease found - not economic.
*** serious.
- not found.

ANTHRACNOSE (Neofabraea malicorticis). (See table 23 above, under perennial canker).
P.D.R. page 64.

TWIG CANKER (Nectria cinnabarina). According to Thomas and Burrell (62) the above fungus in consistently associated with a canker on apple twigs in one orchard in central New York. Infection takes place at or near the point of detachment of the fruit from the cluster base.

HEART ROT (Schizophyllum commune). Reports of this fungus apparently causing damage in North Carolina and North Dakota were received this year. In North Carolina, R. F. Poole reported that trees injured by low temperatures, cultivating implements, and blight were attacked. The fungus was found fruiting on newly blighted twigs during August and September. Large limbs and even trees were killed by the organism working downward from infected areas on the limbs.

SPRAY AND WEATHER INJURY. An excessive amount of injury was reported from New York, Pennsylvania, New Jersey, Delaware, Virginia, West Virginia, Illinois, Michigan, and Arkansas. This was mostly in the form of leaf burning and fruit russeting from applications of lime-sulfur. Weather conditions, especially high temperatures, and in West Virginia, frost were mentioned as largely responsible, but the abundance of scab lesions was also probably a contributing factor. Bordeaux mixture was reported as causing considerable injury in Virginia and Arkansas and copper-lime dust caused severe injury in one New Jersey orchard. In New York too close use of spray gun, spraying in heat of day, and untested lime-sulfur were given as factors. All of the fruit russeting could not be attributed to sprays, because cases of equal damage were observed on unsprayed as well as on sprayed trees.
P.D.R. pages 37, 80.

BROWN ROT (Sclerotinia fructicola). P.D.R. page 79.

LIME CHLOROSIS (non-par.) P.D.R. page 80.

POWDERY MILDEW (Podosphaera leucotricha). P.D.R. pages 17, 36, 64, 79, 100.

MOSAIC (undet.) Has been reported annually from New York during the last few years. In 1929 it occurred in Niagara and Genesee Counties.

PEAR

BLIGHT (Bacillus amylovorus). More damaging than ordinarily in the Middle Atlantic States, the heaviest infection in seven years being reported from Virginia, and in Oregon where the worst outbreaks in recent years occurred in the Rogue and Umpqua Valleys. On the other hand, in Missouri there was said to be less on pears than for a long time. This is always an important disease of pears, especially in the more southern states and in California. Georgia and Louisiana reported the Pineapple variety rather uniformly resistant. (Losses given in table 24).
P.D.R. pages 15, 35, 50, 64, 133.

Table 24. Losses from pear blight as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
80	Georgia	5	Missouri
25	South Carolina, Mississippi	4	Michigan
18	North Carolina	2	Oregon
7	Maryland	1	Massachusetts, Delaware, Ohio, Texas
6	Virginia, Iowa		

SCAB (Venturia pyrina). As in the case of apple scab was rather more abundant than usual. In Virginia the heaviest infecton on record since 1922 took place, the estimated loss for the State being 4.5 per cent. In Ohio the loss was estimated at 1 per cent, Michigan 10 per cent, Wisconsin 5 per cent, and Kansas and Oregon 2 per cent.
P.D.R. pages 38, 65.

LEAF BLIGHT (Fabraea maculata). Has been quite serious in southern Illinois during the last two or three years, even on Kieffer pears. Previous to this the growers have never experienced any particular trouble. (H. W. Anderson). (Losses given in table 25).
P.D.R. page 18.

Table 25. Losses from leaf blight of pear as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	Delaware	2.5	Virginia
4	Maryland	.5	Idaho

PERENNIAL CANKER (Gloeosporium perennans). In Oregon fair-sized cankers occurred in Washington County and specimens showing twig infection were collected in Lane County. (See also under apple, p. 28).

BLACK-END (non-par.) Has been reported from all of the Pacific Coast States, mostly on Bartlett pears. The results of investigations in California, where it is very important, indicate that it is associated with the use of Japanese pear root stocks (29). In 1929 a report from Oregon stated that it was gradually increasing in an orchard in Linn County.

BLOSSOM WILT (non-par.) A very widespread and unusual amount of shrivelling of blossom clusters and even early leaves has been noted throughout western Oregon. The conditions responsible for this are not clearly understood.
(H. P. Barss)
P.D.R. page 65.

BITTER ROT (Glomerella cingulata). P.D.R. page 38.

INCENSE CEDAR RUST (Gymnosporangium blasdaleanum). P.D.R. page 65.

SEPTORIA LEAF SPOT (Mycosphaerella sentina). P.D.R. page 65.

PEACH

BROWN ROT (Sclerotinia fructicola). Occurred generally in peach orchards. Blossom blight was stated to be especially severe in the southern part of New Jersey and in Michigan, while twig blight was particularly noticeable in Pennsylvania. The other states largely mentioned fruit rot. In Indiana the damage was mostly to the mature or harvested peaches. Injury from codling moth, oriental peach moth, and curculio are especially mentioned by several collaborators as causing injuries through which brown rot infection occurred. (Losses given in table 26).

P.D.R. pages 20, 38, 101, 113, 131.

Table 26. Losses from brown rot of peach as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
12	Mississippi	4	Michigan
10	Massachusetts	3	Oregon
9	North Carolina	2	Kansas
6	Missouri	1	West Virginia, Indiana, Iowa, Arkansas
5	New Jersey, Maryland, Virginia, South Carolina, Georgia, Ohio, Texas	.5	Delaware

LEAF CURL (Exoascus deformans). Cool wet weather at the time of bud swelling and subsequent growth in the spring apparently favored curl in the more northern and eastern parts of the country, from New England and New Jersey westward to Kansas. Most of the states in this area reported more than normal amounts. As usual, it was not a factor in the more southern peach districts. In Arkansas it was noted on younger leaves of twigs the older leaves of which were healthy, indicating a late infection. In Illinois there was evidence of secondary spread from unsprayed to adjoining sprayed trees. (Losses in table 27).

P.D.R. pages 18, 37.

Table 27. Losses from peach leaf curl as estimated by collaborators, 1929.

Percentage: loss	States reporting	Percentage: loss	States reporting
6	Michigan	1	Michigan, Virginia, Illinois, Missouri, Oregon
4	Kansas		
3	Iowa	.5	North Carolina, Idaho
2	Ohio		

SCAB (Cladosporium carpophilum). Losses in table 28.
P.D.R. pages 113, 132.

Table 28. Losses from peach scab as estimated by collaborators, 1929.

Percentage: loss	States reporting	Percentage: loss	States reporting
3	Virginia, North Carolina South Carolina, Georgia, Mississippi	1.5	New Jersey
		1	Delaware, Maryland, Ohio, Michigan, Missouri, Texas
2	Kansas		

BACTERIAL SPOT (Bacterium pruni). Continued to damage the peach crop very badly, but perhaps not quite so much as during some other recent years on account of somewhat less injury in the North Atlantic States this season. On the other hand, in the lighter sandy soils of the Carolinas and Georgia, and also in the Indiana, Illinois, and Michigan sections, the loss was rather more than usual. In the Sand Hill section of North Carolina, leaf spotting, defoliation, reduction in size, and spotting of the fruit caused an estimated loss of 30 per cent. The average for the State, however, was 17 per cent, as will be seen from the accompanying table. The Elberta and J. H. Hale, were most commonly reported as

Table 29. Losses from bacterial spot of peach as estimated by collaborators, 1929.

Percentage: loss	States reporting	Percentage: loss	States reporting
17	North Carolina	2	New Jersey, Alabama
15	Indiana	1	Michigan, Kansas, Texas
10	South Carolina, Georgia	.5	Missouri
4	Maryland		

susceptible, but other varieties attacked this year were South Haven, Heath Cling, and Cahmpion in Indiana, Frances, Jersey Gold, and Connett in New Jersey, and Arp and Brackett in North Carolina. Zinc sulfate sprays were tested in several of the states with varying results. (Losses in table 29).

P.D.R. pages 51, 80, 101, 113, 131.

YELLOWS AND LITTLE PEACH (virus). The outstanding features with regard to these diseases seem to be: the occurrence of yellows in Illinois; the increasing importance of little peach and yellows in southwestern Michigan; and the continued decrease in yellows in Pennsylvania, where systematic inspection and eradication has been going on for the last nine years.

The number of trees inspected and the percentage of disease in these three states are given in table 30. (For details see the Plant Disease Reporter Vol. 14, No. 4 (Pennsylvania and Illinois).

Table 30. Results of inspection for peach yellows and little peach in Illinois, Michigan, and Pennsylvania, 1929.

State	Trees inspected	Trees diseased	Percentage of trees diseased
Illinois	375,343	43	.011
Michigan	757,410	(yellows) 2,399	.32
		(little peach) 11,374	1.50
Pennsylvania	1,030,165	1,570	.15

P.D.R. pages 50, 132.

PHONY PEACH (virus). The campaign for the eradication of phony peach being conducted by the Bureau of Plant Industry in cooperation with the Georgia State Board of Entomology, made rapid progress during the 1929 season. Thirty-two inspectors were assigned to this work and up to November 1 this force had inspected over seven million peach trees and had marked 72,418 phony, which were to be removed by digging as soon as possible.

It was thought that this disease was confined to Georgia and a small section of Alabama, but it was found to be more widely spread in Alabama than had been previously supposed and a serious infection was also found in Mississippi. (K. F. Kellerman)

Under provisions of Federal Plant Quarantine 67, effective June 1, 1929, shipments of peach nursery trees from the infested area to places where the disease does not occur is prohibited when phony trees are known to occur within a distance of one mile of the nursery.

P.D.R. pages 19, 66, 171.

ROOT ROT (Armillaria mellea). Widely distributed in North Carolina. It is most prevalent in the commercial plantings in the sand hills. Trees are attacked on the loamy and clay soils, but not so severely. The fungus grows throughout the year, but is most active during the summer and fruits around the tree from September to December. (R. F. Poole)

BLIGHT (Coryneum beijerinckii). Increasing in importance in Idaho due to the substitution of oil for lime-sulfur spray. (C. W. Hungerford)

POWDERY MILDEW (Sphaerotheca pannosa). P.D.R. page 102.

RHIZOPUS ROT (Rhizopus nigricans). P.D.R. page 132.

ROSETTE (Undet.) P.D.R. page 52.

SPRAY INJURY. P D.R. pages 114, 132.

PLUM AND PRUNE

BROWN ROT (Sclerotinia fructicola). See table 31.

Table 31. Losses from brown rot of plum and prune as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
15	Ohio	3	Wisconsin
12	Missouri	2.5	Virginia
10	Massachusetts, North Carolina, South Carolina	2	Kansas
		1	Iowa
6	Maine		
		.5	Delaware
5	Maryland, Michigan, Mississippi		
4	Oregon		

DIAMOND CANKER. A disease of French prune and the variety Standard has been giving trouble in parts of California. The cause is still in doubt. It was reported on during the year by R. E. Smith (57).

CHERRY

BROWN ROT (Sclerotinia fructicola) and BLOSSOM BLIGHT (S. cinerea and S. fructicola) of sweet cherries were more prevalent than usual in western Oregon. The blossom blight was due to both species, cultures from eleven different orchards showing about two-thirds of the blighting due to S. cinerea and one-third to S. fructicola. A heavy bloom in a Napoleon orchard was completely destroyed so that no crop resulted. Bing and Lambert were less affected. There was some fruit rot present at harvest. The loss for the state was estimated at 10 per cent. (H. P. Barss). Losses are given in table 32.

P.D.R. pages 65, 81.

Table 32. Losses from brown rot of cherry as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
20	Oregon	1.5	Virginia, Michigan
2	Ohio	1	Mississippi, Maryland, Kansas, Texas

LEAF SPOT (*Coccomyces hiemalis*). Caused severe defoliation as far west as Nebraska and Kansas. In general the loss from the disease seemed to be unusually heavy. In Kansas it was estimated at 15 per cent, Georgia, Ohio, Michigan and Missouri at 5 per cent, in Iowa 3 per cent, in Maryland 2 per cent, in Virginia, Wisconsin, and Arkansas at 1 per cent, and in Delaware at 0.5 per cent.

P.D.R. pages 37, 52, 81, 102, 132.

WINTER INJURY. The heavy defoliation of 1928 by leaf spot left many cherry trees in Michigan in a very low state of vigor and as a result of temperatures of 18 to 22 degrees below zero thousands of trees were killed during the winter of 1928-29. (H. H. Wedgworth)

BUD BLIGHT (undet.) P.D.R. page 65.

CORYNEUM BLIGHT (*Coryneum beijerinckii*). P.D.R. page 102.

GRAPE

BLACK ROT (*Guignardia bidwellii*). P.D.R. pages 66, 67, 83. See table 33.

Table 33. Losses from black rot of grape as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
20	South Carolina, Arkansas	5	Maryland, North Carolina, Georgia, Michigan, Mississippi
10	Texas		
8	Virginia	2	Wisconsin, Kansas
6	Ohio	.5	Delaware

ANTHRACNOSE (*Sphaceloma ampelinum*). P.D.R. page 83.

DOWNY MILDEW (*Plasmopara viticola*). P.D.R. page 83.

POWDERY MILDEW (*Uncinula necator*). P.D.R. page 67.

ROOT ROT (Phymatotrichum omnivorum). P.D.R. pages 66, 154.

STRAWBERRY

DWARF (Aphelenchus fragariae). A disease apparently caused by the nematode Aphelenchus fragariae and known as "dwarf" in Louisiana and "crimps" in Florida has attracted considerable attention during the past year, both on account of its being a newly recognized trouble and because of its increasing importance. The disease is known to occur in North Carolina, Florida, Louisiana, and Arkansas, authentic specimens having been received by the United States Bureau of Plant Industry from these states. Florida pathologists have evidence of its occurrence also in Tennessee because plants received from that state have evidently been infected. A case of what apparently was the same thing was reported by Orton (48) in 1905 from South Carolina.

In Florida "crimps" is widespread and of major importance. It is estimated that a 2 per cent annual loss of the crop occurs; in individual fields the loss may be as high as 75 per cent of the plants. In Louisiana it is common throughout the whole strawberry district and is believed to be one of the main causes of recent reduction in yield; 10 to 20 per cent infected and consequently worthless plants is not uncommon in unrogued fields.

What is apparently this same disease has been reported from Europe, particularly from England where it is known as "red plant" or "cauliflower disease" and where it has caused increasing damage during recent years.

P.D.R. pages 53, 77, 162.

"MOSAIC" ? This disease seems to be of the virus type but practically nothing is known regarding its transmissibility or nature and so there is some question as to whether the common name "mosaic" is applicable. It is undoubtedly different from the xanthosis or yellows of the Pacific Coast and from the dwarf or crimps of the Southern States. Thus far it has been found only in northern and eastern United States and Canada. During the year it was reported authentically from Ontario, Maine, Massachusetts, New York, New Jersey, and Wisconsin, and what apparently is the same disease has been seen by other workers in Ohio, Illinois, Michigan, and Minnesota. In some plantations and on certain varieties this disease seems to be of considerable economic importance. (Pl. Dis. Reptr. 13: 77, 129-131. Sept. 15, 1929).

GRAY-MOLD ROT (Botrytis cinerea). The worst outbreak of Botrytis on strawberries that he has ever seen in the South was reported by N. E. Stevens in early May. It was by far the worst in the Chadbourn section of North Carolina than it has been during the past four years. This he attributes to unseasonably cool and wet weather.

P.D.R. pages 21, 82.

ANTHRACNOSE (Colletotrichum sp.) P.D.R. page 162.

ROOT KNOT (Caconema radicicola). P.D.R. pages 10, 162.

FRUIT ROTS. P.D.R. pages 53, 163.

LEAF SCORCH (Diplocarpon earliana). P.D.R. pages 39, 53.

LEAF SPOT (Mycosphaerella fragariae). P.D.R. pages 39, 52, 82, 103, 163.

ROOT ROT (undet.) P.D.R. pages 67, 81, 163.

VIRUS DISEASES. P.D.R. pages 129-131.

RASPBERRY

MOSAICS AND LEAF CURL (virus). In New York, yellow mosaic in red varieties is much less important than red raspberry mosaic because in most varieties on the average it does not cause serious injury to the plants. In black varieties it is very injurious. Red raspberry mosaic seems to be of increasing importance in Plum Farmer and other Black varieties in Ontario County.

Leaf curl "No. 1" is rarely found in New York and then mostly on Cuthbert. The leaf curl which is serious on black varieties in Ohio and may be called leaf curl "No. 2" is not found in New York. (W. H. Rankin) Losses are given in table 34.

P.D.R. 82, 83, 103, 114.

Table 34. Losses from raspberry mosaics and leaf curl as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
30	Massachusetts	5	Wisconsin
12	Ohio	4	Kansas, Idaho
11	Maine	3	Maryland
10	Michigan, Iowa	1	Montana, Washington

ANTHRACNOSE (Plectodiscella veneta). P.D.R. pages 39, 53, 82, 103, 115.

ANTHRACNOSE (Gloeosporium allantosporum). Occurring on wild and cultivated black raspberry and St. Regis red raspberry in western Oregon and Washington, was described during the year by Zeller (74).

CANE SPOT (Ascospora rubi). P.D.R. page 82.

POWDERY MILDEW (Sphaerotheca humuli). P.D.R. page 82.

PREMATURE DYING (undet.) P.D.R. page 103.

STREAK (virus). P.D.R. pages 83, 114.

WILT (Verticillium sp.) P.D.R. page 82.

YELLOW RUST (Phragmidium imitans). P.D.R. pages 82, 163.

GOOSEBERRY

RUST (Cronartium ribicola). Scattered slight infections occurred in Connecticut on the gooseberry, which is usually considered almost immune. (G. P. Clinton)

LEAF SPOT (Mycosphaerella grossulariae). P.D.R. page 103.

POWDERY MILDEW (Sphaerotheca mors-uvae). P.D.R. page 39.

CRANBERRY

FALSE BLOSSOM (virus). The outstanding cranberry problem at the present time is the control of the disease known as false blossom. During the past year it has been established to the satisfaction of all cooperating agencies that this disease is transmitted by a leafhopper, Euscelis striatulus. The disease is present in all commercial cranberry-growing states except New York which has a small cranberry industry on Long Island. In Washington and Oregon, the disease apparently does not spread and is of little economic importance. In Wisconsin, the disease appears to be gradually increasing in abundance and locally it is very severe. In the largest cranberry-growing areas of the United States, namely, eastern Massachusetts and New Jersey, the disease is severe and is spreading rapidly. The Howes, the standard late variety of cranberry which constitutes about 35 per cent of the crop in Massachusetts and about 30 per cent of the crop in New Jersey, is proving very susceptible to false blossom and unless some effective control is devised this variety is apparently threatened with commercial extinction. (N. E. Stevens and H. F. Bain)

CITRUS

CANKER (Bacterium citri). There can be no doubt of the success of the campaign for the eradication of citrus canker, a disease which threatened the destruction of the citrus industry, when one considers the rapid reduction of infected trees and the thoroughgoing success in preventing epidemics in commercial regions. Although the disease is not entirely eradicated from the United States, conditions indicate the effectiveness and value of this campaign and support the belief that final and complete eradication of citrus canker will be accomplished.

Florida, with its large citrus holdings, now has just two properties under suspicion because of infections found in 1927, although at various times 515 properties scattered through 25 counties in that State have been found infected with this disease. The following figures give an estimate of the results of the campaign in the number of infected grove trees found in Florida alone:

1916 ---- 2,294
1917 ---- 372
1918 ---- 15
1919 ---- 4

1920 ---- 540
1921 ---- 0
1922 ---- 873
1923 ---- 11

1924 ---- 0
1925 ---- 5
1926 ---- 2
1927 ---- 85
1928 ---- 0
1929 ---- 0

Alabama has not reported an infection since June, 1927, when one tree was found infected. That the campaign was successful in this state is evidenced by the fact that 621 properties have been found infected at various times and at the present time, the state is believed to be free from canker.

In 1916, Mississippi had 108 properties in 4 counties showing infections. In 1922 there were 8 infected properties. In 1923 all properties were declared "clean" and no infections have been reported since that time.

Citrus canker has been found in 9 counties in Texas but it is believed that it has been eradicated from that state now as no infection has been reported since February, 1929.

Louisiana is still reporting scattered infections, especially in dooryard plantings, but the number of infections is being reduced each year. (K. F. Kellerman)

GRAPEFRUIT BLOTCH (Undet.) P.D.R. Vol. 14: 68. 1930.

LUMPY RIND (Undet.) P.D.R. Vol. 14: 67. 1930.

ROOT ROT (*Phymatotrichum omnivorum*). P.D.R. page 154.

SOUR ROT (*Oospora* sp.) P.D.R. page 53.

FIG

THREAD BLIGHT (*Corticium koleroga*), a tropical parasite, bids fair to become one of the more serious diseases of figs in Louisiana. This parasite, affecting many plants, has been known in Louisiana for several years, but appears to be spreading rather rapidly.
P.D.R. page 115.

BROWN ROT (*Sclerotinia fructicola*). Found occasionally on Kadota figs near infected peaches at Riverside, California, following a rain. (W. T. Horne)

PERSIAN (ENGLISH) WALNUT

BACTERIAL BLIGHT (*Bacterium juglandis*). In 1929 it was reported to the Survey for the first time from Mississippi and Arkansas. This is a very important disease in walnut orchards of California and Oregon and has been frequently reported from several of the Eastern States.
P.D.R. page 22.

FILBERT

BACTERIAL BLIGHT (*Bacterium* sp.) Has been reported frequently from Oregon since 1914. It occurs generally in western Oregon and will probably be found to a greater or less extent wherever filberts are grown in the State. It is the most serious disease of young plantings and nurseries, spotting the leaves and blighting the shoots. In 1929 it was reported to the Disease Survey from Washington for the first time (Cowlitz County). The Bureau of Plant Industry is undertaking investigations of the cause and control of this disease.

DISEASES OF VEGETABLE CROPS

POTATO

LATE BLIGHT (Phytophthora infestans). Estimated percentage losses are given in table 35. In the main-crop, late potato states where blight usually does the most damage, it was conspicuous this year by its scarcity. Dry weather during summer and fall effectively checked it. In New York there was almost no blight to be found in the State, except in a small area south of the Finger Lake region.

The most outstanding fact with regard to the disease in 1929 was its unusual seriousness in some of the early potato sections of the southern states, particularly South Carolina, Georgia, Florida, Louisiana, and Arkansas. In South Carolina, where it is usually rare, it occurred in epiphytotic proportions along the coast during April and May. In the Charleston section practically every field was affected. One owner reported over 40 per cent loss on 490 acres and the loss in Charleston County was estimated to be between 25 and 50 per cent. For the State as a whole 10 per cent loss was estimated. From Savannah, Georgia, specimens and a report of considerable damage were received. In Louisiana it was observed for the first time in several years, in fact, it has only been noted on two previous occasions during the past twenty years, and then only in very mild form. In 1929, however, in the vicinity of Baton Rouge during the latter part of April, it appeared shortly before harvest time in severe form. In Arkansas also it was observed for the first time in several years, diseased material having been sent in from Ozark.

As to the extent to which these southern occurrences were influenced by the planting of infected seed from northern states nothing definite can be said. However, the 1928 crop from the northern seed-producing states carried a large amount of late blight rot, and it is potatoes from these states that are largely planted in the early southern areas. The outbreak at Baton Rouge, Louisiana, occurred on certified Bliss Triumph seed from Eagle River, Wisconsin.

Another interesting occurrence was that reported from Floyd County in southern Indiana, where it caused a severe loss to the late crop and resulted in much storage rot. Late blight is a rather rare disease for Indiana which is on the western and southern border of the normal range of Phytophthora on the late crop.

P.D.R. pages 25, 57, 95, 118, 119, 151, 156.

Table 35. Losses from late blight of potato as estimated by collaborators, 1929.

Percentage Loss	States reporting	Percentage loss	States reporting
10	South Carolina	Trace	Massachusetts, New York, West Virginia, Ohio, Wisconsin, Minnesota, Arkansas, Washington
2	Maine, Maryland, North Carolina		
1	Florida		

SCAB (Actinomyces scabies). More than usual was reported from New Hampshire, New York, Delaware, Arkansas, Ohio, Michigan, Wisconsin, and Idaho. The average amount occurred in Florida, Minnesota, Iowa, Missouri, and California. There was less than usual in Massachusetts, New Jersey, Maryland, West Virginia, Virginia, and Louisiana. Losses reported were 5 per cent in Iowa, 4.5 per cent in Delaware, 4 per cent in Wisconsin, 3.5 per cent in New York (according to Chupp this is probably too low and 5 per cent would be more nearly right), 3 per cent in North Carolina, 2 per cent in Texas and Kansas, 1.5 per cent in Maryland and Missouri, 1 per cent in Minnesota, 0.5 per cent in Massachusetts, 0.3 per cent in Ohio.

The collaborator from New Jersey makes the following report: The hot dry season was very favorable for the development of the disease, some fields showing it where little was present the past two years. This disease, however, is causing the average grower little concern. Through the use of acid fertilizers the soil reaction has been reduced to about Ph 5.2 to Ph 5.4 in most of the potato growing sections. In some instances the reaction has been reduced to as low as Ph 4.6, and in these cases the rye cover crop is yellow and has made poor growth. These growers are being advised to use small amounts of lime. Studies conducted again this year indicate that the use of certain mercurial compounds in the fertilizer greatly reduce both scab and Rhizoctonia. (W. H. Martin)

P.D.R. pages 57, 96, 150, 156.

MOSAIC (virus). High summer temperatures resulted in masking of symptoms with the result that it was difficult to detect mild mosaic in particular. In prevalence both the rugose and the mild mosaic were generally reported to be normal or less. Two states reported reduced losses through the use of certified seed, but in one of them this was offset by the increase of mosaic in home-grown seed. (Losses in table 36.)

P.D.R. pages 40, 119, 135.

Table 36. Losses from potato mosaic as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
15	Arkansas	4	Maine, New York
8	Oregon	3.5	Maryland
6	Washington	2	Ohio, Indiana, Iowa, Texas
5	Minnesota, Montana, Idaho	1.5	New Jersey, North Dakota
4.5	North Carolina	Trace	Massachusetts, Delaware South Carolina, Florida, Wisconsin, Missouri, Kansas

LEAF ROLL (virus). Normal or subnormal amounts of leaf roll were reported. The increasing use of certified seed seems to be reducing losses gradually. In New Jersey, for instance, the fact that less leaf roll is being found each year is correlated with the increase in use of certified seed. In Maryland, where much uncertified home-grown Irish Cobbler seed was planted on account of low prices, there was an increase in leaf roll. Losses in the home-grown seed were 15 to 50 per cent, whereas in the northern certified seed they were very small. (Losses in table 37.)

P.D.R. pages 40, 96.

Table 37. Losses from potato leaf roll as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
8	New York	2.5	Maryland
5	Ohio, Indiana	2	North Carolina, Iowa, Idaho, Washington
4	Maine	Trace	Delaware, Missouri, North Dakota, Arkansas, Texas, Montana
3	Massachusetts, New Jersey, Oregon		

SPINDLE TUBER (virus). In studying the rate of spread of potato virus diseases, Goss (21) concluded that spindle tuber, on account of the ease of transmission, is more to be feared under western conditions than leaf roll or either of the mosaics. New Jersey and Minnesota report decline in the amount of spindle tuber in certified stocks. Two per cent loss was reported in Kansas, 1.5 in North Dakota, and 0.5 in New Jersey.

P.D.R. page 120.

A NEW DISEASE(?) of unknown cause, with symptoms somewhat like the psyllid-yellows reported from Utah, was reported from Michigan. No psyllids were observed. The tarnished plant bug (Lygus pratensis) appears to be associated with the trouble (not proved). A maximum of 1.5 per cent was reported in certified fields. As much as 6 per cent was found in single tuber clones of virus-free stock grown under isolation at the Agricultural College. (J. E. Kotila).

SOUTHERN BLIGHT (Sclerotium rolfsii) was prevalent in Texas. In some cases in Hidalgo and Cameron Counties 75 per cent of the vines and 5 to 10 per cent of the tubers were affected. The loss for the State was estimated at 2 per cent. (J. J. Taubenhaus and W. J. Bach).

P.D.R. page 25, 72.

BLACKLEG (Bacillus phytophthorus) was general and more severe than usual in Wisconsin, Idaho, and eastern Oregon. The other states reported either less than the average or normal amounts. (Losses in table 38.)

P.D.R. page 119.

Table 38. Losses from blackleg of potato as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
6	Oregon	.5	Maryland, West Virginia, Ohio, Minnesota
3	Kansas	Trace	New York, New Jersey, Wisconsin, Washington
2	Montana, Idaho	1	Maine, North Carolina, Iowa, Missouri
1.5	North Dakota		

HOPPERBURN AND TIPBURN (leafhoppers and excessive transpiration). Hot dry weather was favorable to these diseases with the result that more than the usual damage was reported in northern and eastern potato states. Several collaborators reported that in fields where Bordeaux mixture was thoroughly and frequently applied the losses were maintained at a minimum. (Losses in table 39).

P.D.R. pages 58, 95, 118, 120.

Table 39. Losses from tipburn and hopperburn of potato as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
31	Arkansas	2	Wisconsin
15	New York, West Virginia	1	North Dakota, Texas
10	Massachusetts, Minnesota	.5	Delaware
9	Ohio	Trace	Maryland, Missouri, Kansas, Montana, Oregon
8	New Jersey, North Carolina		

YELLOW DWARF (Undet.), reported for the first time in 1922 by Barrus and Chupp (6) from several New York counties, but observed by them since the summer of 1917, has since occurred in New Jersey (1922; 1926 in seed from New York), Pennsylvania (1922), Vermont (1922), Florida (1923 northern seed), New Hampshire (1925), Ohio (1926, New York seed), and Virginia (1926, New York seed). In 1929 it was reported from fourteen counties in New York, from New Jersey where it was observed on one plant in a field planted with New York grown seed, and for the first time from Michigan where a few cases were noted.

SCURF, STEM ROT (Corticium vagum).P.D.R. pages 57, 96, 119, 150, 156.

Table 40. Losses from Rhizoctonia on potato as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	Oregon	2	North Carolina, Ohio, Iowa Missouri, Texas, Washington
9	Kansas		
6	Maine	1	Massachusetts, Wisconsin
5	Maryland	.5	Idaho
3	Montana	Trace	North Dakota, Arkansas

EARLY BLIGHT (Alternaria solani). P.D.R. pages 58, 118,119.

Table 41. Losses from early blight of potato as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
1.5	South Carolina	Trace	New York, New Jersey, Delaware, West Virginia, Wisconsin, Minnesota, Missouri, North Dakota, Kansas, Arkansas, Montana, Idaho, Washington, Oregon
1.3	North Carolina		
1	Ohio, Texas		
.5	Maryland		

WILT (Fusarium spp.) P.D.R. page 119.

Table 42. Losses from Fusarium wilt of potato as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
4	Montana	Trace	North Carolina, Minnesota, Missouri, North Dakota, Kansas, Washington, Oregon
1	New Jersey, Maryland, Texas		
.5	New York, Ohio, Iowa, Idaho		

SWEET POTATO

SOIL ROT (Actinomyces p.). Until recently this disease has been ascribed to Cystospora batata (Ell. & Halst.) Elliott, but it is now attributed to an Actinomyces, which Adams (2) designates as "Actinomyces p."

STEM ROT (Fusarium spp.) P.D.R. pages 135, 156, 157.

Table 43. Losses from stem rot of sweet potato as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
7	Iowa	1.5	Missouri
5	Kansas	1.2	Illinois
4	Delaware	1	Maryland
3	North Carolina, Mississippi, Arkansas	Trace	South Carolina
		2	Texas

BLACK ROT (Ceratostomella fimbriata) P.D.R. pages 43, 156.

Table 44. Losses from black rot of sweet potato as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	Texas	1.5	Maryland
5	Mississippi, Arkansas, Washington	Trace	South Carolina, Missouri
		.5	Iowa
2	Delaware, North Carolina, Kansas		

STORAGE ROTS due to various fungi.

Table 45. Losses from storage rots of sweet potato as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
20	South Carolina	13	Kansas
15	Maryland, North Carolina, Arkansas	10	Texas
		3	Delaware

CHARCOAL ROT (*Sclerotium bataticola*), JAVA BLACK ROT (*Diplodia tubericola*) LEAF BLIGHT (*Phyllosticta batatas*), LEAF MOLD (*Choanephora cucurbitarum*), LEAF SPOT (*Alternaria* sp.), MOSAIC (Virus?), SCURF (*Monilochaetes infuscans*), SOFT ROT (*Rhizopus nigricans*), SOUTHERN BLIGHT (*Sclerotium rolfsii*), WHITE RUST (*Albugo ipomoeae-panduranae*).

P.D.R. pages 156, 157 (reports from Florida).

TOMATO

BLIGHT (*Septoria lycopersici*). P.D.R. pages 41,42, 90, 94, 136, 155, 164.

Table 46. Losses from tomato blight as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	Kansas	2	Missouri
6	Indiana	1.5	South Carolina
5	West Virginia, North Carolina, Texas	1	Maryland, Arkansas
		.5	Delaware
4	New Jersey, Wisconsin		
		Trace	Minnesota, Mississippi
3	Ohio, Iowa		

EARLY BLIGHT (*Alternaria solani*). P. D.R. pages 40, 90, 94, 134.

Table 47. Losses from early blight of tomato as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
15	Massachusetts	1	North Carolina, Indiana Texas
8	Georgia		
		1.5	New Jersey, South Carolina
5	Maryland		
4	Mississippi	.5	Delaware
2	Missouri, Arkansas	Trace	Wisconsin, Minnesota, Montana

WILT (Fusarium lycopersici). P.D.R. pages 40, 41, 90, 135, 155.

Table 48. Losses from Fusarium wilt of tomato as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
15	Arkansas	2	North Carolina, Missouri, Kansas
10	Georgia, Mississippi		
		1	Maine, Maryland, Ohio
6	New Jersey		
		.5	Indiana
5	South Carolina, Texas		
		Trace	Delaware, Wisconsin, Iowa, Washington

LATE BLIGHT (Phytophthora infestans). Tomato-growing sections along the coast of California have suffered severely during the past few years from epiphytotics of late blight (Phytophthora). Total loss of fruit in some fields has been sustained. Cars of tomatoes shipped to markets have shown 50 to 100 per cent decay. Inspection certificates covering 30 cars shipped east in 1927 showed an average of 40 per cent infection. (G. B. Ramsey and Alice A. Bailey (50).

P.D.R. page 149.

DIE-BACK (cause unknown). In the last few years a disease known in California as die-back or tip blight of tomatoes has been so severe nearly every season in certain coastal sections as to result in practically an abandonment of tomato growing in these regions. Usually only a few sporadic cases have been found in the warmer and drier inland areas, but in 1929 the disease appeared in commercial tomato fields in the vicinity of Merced in the interior of the State, and also occurred near Riverside. (F. S. Beecher and Michael Shapovalov).

P.D.R. page 148.

LEAF SPOT (Stemphylium sp.). This disease, recently prominent in Florida, caused more damage than any other tomato disease during the past season. The lower leaves were "fired" early and at midseason 100 per cent infection was common. It was found on both Coasts in increasing destructiveness. (G.F.Weber)

P.D.R. page 134.

LEAF and STEM SPOT (Ascochyta lycopersici Brun. and Phoma destructiva Plowr.). It is not unlikely that these names represent different phases of the same fungus, which may also be connected with Didymella lycopersici Kleb. (Diplodina lycopersici (Cke.) Hollos), the cause of tomato stem canker in Europe. In 1929 A. lycopersici was reported from New Jersey and Virginia. A Phoma agreeing very closely with P. destructiva was isolated by Charles Chupp from superficial sunken cankers on the stems and from leaf lesions of plants imported into New York from Georgia.

P.D.R. pages 10, 42, 134.

COLLAR ROT (caused by various organisms, such as Rhizoctonia, Phytophthora, Ascochyta, but especially Alternaria.). Collar rot causes the loss of many young plants annually, and 1929 was no exception. Plants usually become infected near the ground level or higher up on the stem while in the seed beds, and after they are set out in the field, the rot progresses, plants die or are retarded in growth, and uneven stands result. In New York unfavorable weather resulted in plants being held in the beds somewhat longer than usual and much loss resulted. In one county it was estimated that more than a million plants had to be thrown away. In New Jersey and Delaware, collar rot was especially common on southern-grown plants, particularly when they had to be held some time before being set out. In some cases fields had to be reset twice. In Indiana a field set with Illinois plants showed 25 per cent collar rot, while another block in the same field set with Texarkana plants showed none.
P.D.R. page 40.

BACTERIAL CANKER (*Aplanobacter michiganense*) was reported for the first time from two new States, Maryland and Mississippi. In the latter it was found in a number of properties in the Crystal Springs section. Seventy-five per cent of the fruit from one forty-acre field was unmarketable and the loss was estimated at $15,000. Infection in fields in Indiana and New Jersey was traceable to plants imported from Georgia. Mary K. Bryan (10) reports the organism as the cause of a fruit spot in Georgia and Mississippi.

Table 49. States from which *Aplanobacter michiganense* has been reported and year of first report.

Year	State	Year	State
1909	Michigan	1927	Georgia, Montana, Utah, Wisconsin
1918	New Jersey, Pennsylvania	1928	California, Washington
1920	Massachusetts, New York	1929	Maryland, Mississippi
1924	Ohio, Connecticut, Indiana Illinois, Iowa		

P.D.R. pages 24, 40, 41, 90.

ROOT PARASITE (*Aphanomyces cladogamus* Drechsler). This fungus, which affected tomato rootlets in a greenhouse in the District of Columbia, had previously been provisionally referred to *A. euteiches*. (17).

BACTERIAL SPOT (*Bacterium vesicatorium*). P.D.R. pages 40, 42, 134.

BACTERIAL WILT (*Bacterium solanacearum*). P.D.R. p. 135.

BLOSSOM-END ROT (non-par.). P.D.R. page 135, 136.

BROOM RAPE (*Orobanche ramosa*). P.D.R. page 165.

BUCKEYE ROT (*Phytophthora terrestris*).P.D.R. page 135.

DAMPING-OFF (various fungi). P.D.R. page 88.

MOSAIC (virus). P.D.R. pages 94, 135, 155.

NAILHEAD (*Macrosporium tomato*). P.D.R. page 134.

ROOT KNOT (*Caconema radicicola*). P.D.R. page 40.

SOIL ROT (*Rhizoctonia solani*). P.D.R. page 134.

SOUTHERN BLIGHT (*Sclerotium rolfsii*). P.D.R. page 135.

STREAK (virus). P.D.R. page 26.

BEAN

For a summary of conditions in Western States in 1929 see W. J. Zaumeyer, (73).

ANTHRACNOSE (*Colletotrichum lindemuthianum*). Dry weather in the principal northern dry bean states held anthracnose at a minimum. In the southern states, however, from North Carolina southward, the early snap bean crop suffered to an unusual extent. In some truck sections of the South the outbreak assumed the proportions of an epiphytotic. In Louisiana on some days as high as 25 per cent of the beans offered for shipment were rejected and, as will be noted from table 50, 10 per cent loss was reported from the Carolinas. This prevalence in the South seems to be correlated somewhat with the planting of infected seed from the North. It will be recalled that in 1928 anthracnose was serious in the North Atlantic and Great Lakes States.

P.D.R. pages 42, 58, 94, 120, 135.

BACTERIAL BLIGHTS (caused by various bacteria). The situation with regard to the bacterial blights of beans is becoming more complicated as different organisms are recognized and as some of those which have been recently described become more widely distributed or better known. (Losses in table 51)

Table 50. Losses from bean anthracnose as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	North Carolina, South Carolina	.5	Ohio
		1	Georgia
5	Mississippi		
		Trace	New York, Delaware, Maryland, West Virginia, Michigan, Minnesota, Iowa, Kansas
3	Massachusetts, Wisconsin, Missouri		
2	Maine		

Table 51. Losses from bacterial blight of bean as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	North Carolina, South Carolina, Minnesota Texas	1.5	Michigan
		2	Maryland, Montana
4	Wisconsin, Mississippi	.5	Ohio
3	New York, Georgia	Trace	Massachusetts, Delaware, Iowa, Kansas, Oregon

Bacterium phaseoli was commonly reported as usual. North and South Carolina especially reported more damage than ordinarily. In dry bean fields of New York there was comparatively little, but in beans grown for canning somewhat more was evident.

Bacterium medicaginis phaseolicola, described by Burkholder (12) from New York in 1926 and reported from Montana and Utah in 1927, and from South Carolina, Georgia, Florida, Wisconsin, Colorado, and Wyoming in 1928, was recognized even more widely in 1929 when it was reported for the first time from Mississippi and Michigan. In New York it was thought to cause about 1 per cent damage, but in general the season was too dry for development. In South Carolina the losses in Beaufort County were about 30 per cent, but for the State as a whole only a trace was reported. While less damaging to the stand in Georgia than in 1928, halo blight developed late in the season and was noted especially in some lots of Bountiful seed from Michigan. Ten per cent loss was estimated. In Michigan it was especially serious in Red Kidneys. It is said to have been increasing in importance there for some time and is now found rather generally in the State.

It is of interest to note that this organism has now been found causing a disease of beans in Germany (58).

P.D.R. pages 42, 58, 91, 94, 96, 120, 121, 135, 155.

MOSAIC (virus) occurred in nearly every field in New York, especially on Refugee Stringless Greenpod, reduction in yield estimated at 10 per cent, resulting from 16 per cent of the plants in the State being diseased. Idaho grown seed especially resulted in severely affected crops. There was not much mosaic on dry beans. (C. Chupp and J. G. Horsfall).

Very serious in Michigan canning crop, especially in Stringless Refugee variety. Disease spread very rapidly in July. Not important in white bean crop. (Ray Nelson).

Zaumeyer (73) reported that mosaic was distinctly more widespread in western states than any of the other bean diseases. Losses are given in table 52.

P.D.R. pages 121, 155.

Table 52. Losses from bean mosaic as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	New York	2	Maine, Texas
5	Kansas, Washington, Oregon	1	Massachusetts, Ohio, Michigan, Wisconsin, Minnesota
4	Montana, Idaho		
		Trace	Maryland, Iowa
3	Mississippi		

ROOT ROTS(various organisms).

ROOT ROT (Fusarium sp.) Dry root rot was very prevalent in the principal bean growing areas of California. It is probably the most serious bean trouble in the State. Some fields were a total loss. No variety appeared to be resistant.

A wilt caused by Fusarium sp. was found on pink beans in the upper Sacramento Valley. In one field there was 2 to 3 per cent loss, but in others, the loss was slight. (J. B. Kendrick).

P.D.R. page 42.

Table 53. Losses from bean root rots, due to various organisms, as estimated by collaborators, 1929.

Percentage loss	States reporting	Percentage loss	States reporting
10	South Carolina	1	Texas, Montana
5	Massachusetts	.5	Ohio
3	Idaho	Trace	Maryland, Wisconsin, Minnesota, Kansas, Washington
2	Oregon		

ASHY STEM BLIGHT (Macrophoma phaseoli). This disease, first reported from South Carolina in 1923 (1), from Georgia and Mississippi in 1926, and reported from these states frequently since, was mentioned in Disease Survey reports in 1929 only from Georgia where it occurred scatteringly in very slight amounts, much earlier in the season than heretofore.

P.D.R. page 42.

"BALDHEAD". Harter (24) has shown that this seedling abnormality in which the plumule is absent is due to injury by the threshing machine and rarely occurs in beans threshed by hand. The epicotyl is fractured just below the plumule. Snap beans are more susceptible to the injury than field beans. Lima beans are also affected.

ROOT ROT (Rhizoctonia sp.) P.D.R. pages 91, 155.

RUST (Uromyces appendiculatus). P.D.R. pages 73, 135.

LEAF SPOT (Cercospora sp.) P.D.R. page 42.

LIMA BEAN

YEAST SPOT (Nematospora phaseoli) was first described from Virginia by Wingard in 1922 (71). Since then it has been found in Illinois in 1923, in Maryland and Mississippi in 1927, and on lima bean seed from Alabama and Tennessee. In 1929 G. W. Fant reported that he received specimens from Elizabeth City, North Carolina.

STEM ROT (Corticium vagum). The unusual prevalence of this disease in New Jersey was accounted for by dry soil conditions. In the case of both potatoes and peas, Rhizoctonia injury has been found to be much more severe in dry than in wet soil. In some fields the crop was a total failure due in part to leafhoppers but mostly to stem rot. In this connection it should be said that the red spider was present in large numbers in these fields. The loss for the State was estimated at 5 per cent. (W. H. Martin).
P.D.R. page 10.

BACTERIAL LEAF SPOT (Bacterium vignae), BLIGHT (Bacterium phaseoli), MOSAIC (virus). P.D.R. page 72. (reports from Maryland).

CRUCIFERS

MOSAIC (virus). Clayton (14) concludes that crucifer mosaic is and will continue to be, "a minor disease on Long Island because of the natural resistance of the most important economic cricifers, cabbage, cauliflower, and Brussels sprouts and also because these crops are grown during the cool weather of fall, whereas the disease develops best at high temperatures."

CABBAGE

CLUB ROOT (Plasmodiophora brassicae) has been increasing in New York State but the use of hydrated lime is coming into practice so rapidly that probably there is a fairly large decrease in the losses. (Charles Chupp).
P.D.R. pages 151, 156.

TIP BURN (non-par.). A publication has been prepared recording three years' work showing that a fertilizer with a high phosphorus and low potash content increases tip burn, while about a 1 - 2 - 2 ratio reduces very much the amount of injury. Nearly all the tip burn occurs on Danish Baldhead. (Charles Chupp).

BLACK LEG (Phoma lingam). P.D.R. pages 151, 156.

BLACK ROT (*Bacterium campestre*). P.D.R. pages 3, 10, 59, 155, 156.

DOWNY MILDEW (*Peronospora parasitica*). P.D.R. pages 10, 155.

DROP (*Sclerotinia sclerotiorum*). P.D.R. page 151.

LEAF SPOT (*Bacterium* sp.) P.D.R. page 59.

SOFT ROT (*Bacillus carotovorus*). P.D.R. page 156.

YELLOWS (*Fusarium conglutinans*). P.D.R. pages 3, 156.

CAULIFLOWER

CLUB ROOT (*Plasmodiophora brassicae*). So much hydrated lime is used in nearly all cauliflower fields that club root is not a menace on this crop. It is present in the Schenectady-Albany district where liming is not a common practice. (Charles Chupp).

RING SPOT (*Mycosphaerella brassicicola*). P.D.R. page 10.

HORSE-RADISH

BACTERIAL LEAF SPOT (*Bacterium campestre armoraciae*) has been described during the year by Lucia McCulloch. (42). It is known to occur in Virginia, the District of Columbia, Connecticut, Missouri, and Iowa. Morphologically and culturally the organism resembles *Bacterium campestre* and *B. phaseoli*, but it is different in its host reactions.

ROOT ROT (Undet.). For the past two years a serious root rot has occurred in commercial beds of horse-radish in two fields in St. Louis County, Missouri. Species of Fusarium have been isolated but the pathogenicity of the forms has not been determined. (I. T. Scott.)

KALE

YELLOWS (*Fusarium conglutinans*) is a very important disease in the Petaluma district of California, where kale is widely used as a green food for chickens. Yellows is widely distributed there and is forcing many ranchers to find a substitute crop for poultry greens. (Kendrick (34).)

RADISH

A BACTERIAL SPOT (undet.) of radish and turnip was found in Indiana in 1928 and reported by White and Gardner (69). In greenhouse inoculation tests the organism also infected cabbage, Brussels sprouts, cauliflower, mustard, and tomato.

TURNIP

LEAF SPOT (Cercosporella albo-maculans). Large fields grown for canning purposes in George County, Mississippi, were rendered entirely worthless by this trouble. Tests showed that infection did not come from seed. (Miles and Fenner).

ROT (Rhizoctonia sp.). Lauritzen (38) has recently called attention to a storage decay of turnips and rutabagas which he has observed at the Arlington Experimental Farm, Virginia, and on the New York City and other markets. The pathogen is believed to be a strain of Rhizoctonia solani. The losses depend on storage conditions.

CUCURBITS

MUSKMELON

DOWNY MILDEW (Pseudoperonospora cubensis). Severe loss in Wicomico County, Maryland, followed cold foggy weather early in the season. Losses were almost total in fields which were not sprayed or dusted. For the State as a whole the total loss is estimated at 15 per cent, which includes 5 per cent reduction in yield and 10 per cent loss in quality. (R. A. Jehle).

In North Carolina downy mildew was very prevalent and destructive, causing 15 per cent reduction in yield and 5 per cent loss in quality. One application of Bordeaux misture when the disease first appeared greatly reduced losses, while two applications prevented damage. (F. W. Fant).

Infection was heavier and earlier than usual in Georgia, but not so early or damaging as on cucumbers and watermelons. Downy mildew is rarely as destructive as leaf blight or powdery mildew. Loss, a trace. (O. C. Boyd).

P.D.R. page 97.

BACTERIAL LEAF SPECK (Undet.). This disease, observed in previous years and reported to the Survey in 1928 as of undetermined cause, was more prevalent this year than usual in Georgia, causing severe premature defoliation in many smaller plantings. The bacterial character of the disease was confirmed by Miss Mary K. Bryan. Typical "speck" lesions were obtained by inoculating cantaloupes and watermelons with water suspensions from diseased cantaloupe leaves at the Albany field station. (O. C. Boyd).

FRUIT ROT (Phytophthora sp.). Charles Drechsler (18) isolated this organism from decaying tissue of a Honey Dew melon originating presumably in California or Colorado. On inoculation into healthy fruit it proved to be an efficient parasite, causing decay similar to that in the original specimen.

SOUTHERN BLIGHT (Sclerotium rolfsii). Melons rotted badly in some fields in North Carolina, the fungus entering the tissues next to the soil. The ripening and over-ripened melons were attacked. Green melons were not attacked. In some fields the loss of plants amounted to 5 to 10 per cent. (R. F. Poole).

BACTERIAL WILT (Bacillus tracheiphilus). P.D.R. page 122.

LEAF BLIGHT (Macrosporium cucumerinum). P.D.R. page 136.

MOSAIC (virus). P.D.R. page 122.

CUCUMBER

MOSAIC (virus). R. H. Porter (49) has isolated a virus from mosaic cucumbers growing in a greenhouse at Bettendorf, Iowa. When inoculated into the cucumber variety Chinese Long and watermelons, which are resistant or immune to the ordinary cucumber mosaic, it produced typical symptoms. He calls this the "Bettendorf mosaic" to distinguish it from the common "white pickle mosaic." The two diseases differ with regard to symptoms, period of incubation, and host range.
P.D.R. page 122.

BACTERIAL WILT (Bacillus tracheiphilus). This common disease was reported as occurring widely, but only in two states, Massachusetts and Michigan, was it mentioned as being especially destructive. In Massachusetts it is said to be very important, both in the field and under glass on the fall crop. The growers there are using calcium arsenate-copper lime dust with very good results. In Michigan the most severe epiphytotic affecting the pickle crop in recent years was reported. As high as 50 per cent of the plants were destroyed in many commercial fields.
P.D.R. page 121.

ANGULAR LEAF SPOT (Bacterium lachrymans). P.D.R. page 72.

DOWNY MILDEW (Pseudoperonospora cubensis). P.D.R. page 97.

POWDERY MILDEW (Erysiphe sp.). P.D.R. pages 91, 97.

OTHER VEGETABLES

ANISE

DROP (Sclerotinia sclerotiorum). Anise or sweet fennel, Foeniculum vulgare, is grown extensively as a truck crop in the lower Rio Grande Valley of Texas for shipping to northern and eastern markets. During the year Taubenhaus, Bach, and Ezekiel (60) noticed damage to the crop estimated at from 5 to 10 per cent, apparently caused by Sclerotinia sclerotiorum. This fungus is rather commonly found on various truck crops in south Texas, but this is the first report of its occurrence on this host, not only for Texas, but for the United States.

BEET

DOWNY MILDEW (Peronospora schachtii). Mildew caused serious losses to seed beet production in California the past year. Many fields were a total loss. The disease was present on sugar beets and garden beets, but the greatest damage was reduction in yield of seed. (J. B. Kendrick).

MOSAIC (virus). Table seed beets in the vicinity of Mount Vernon, Washington, have 100 per cent of the plants affected with mosaic. Mottling and necrosis of leaves and dwarfing of the plants is very evident. Ten plantings representing 30 or 40 acres showed this conditions. It was found in three lots of mother beets from this area that were grown in the greenhouse at Pullman during spring and early summer. (Leon K. Jones, June 28).

NEMATODE (Caconema radicicola). P.D.R. page 27.

CARROT

YELLOWS (virus.) Carrot yellows was reported from Maine, New York, Pennsylvania, and Wisconsin. The disease resembles aster yellows and may be due to the same virus. In Wisconsin there was more infection in carrots than in celery or lettuce, all next to an aster yellows experimental plot.
P.D.R. pages 117, 148, 174.

CELERY

YELLOWS (Fusarium sp.) In Michigan, 1929 was the worst year for yellows since 1921. Susceptible varieties were badly diseased in the Kalamazoo area. The resistant strains from Michigan State College, M.S.C. Golden Self Blanching and Newark Market, stood up well beside commercial varieties that were destroyed. The disease was also reported from a few places in Ramsey County, Minnesota. A new feature with respect to this disease is the report of its occurrence in destructive amounts around Canon City, Colorado. From 40 to 50 per cent of the plants in a few fields were reported affected by Le Clerg.
P.D.R. page 121.

ASTER YELLOWS (virus). Severin (53) has reported that yellows of celery and also of lettuce is identical with the aster yellows and is transmitted by Cicadula sexnotata. Folsom in Maine found what seemed to be this same disease and systematic sweepings resulted in capturing the leafhopper. In Wisconsin the disease was found on celery growing adjacent to an experimental aster yellows plot.
P.D.R. page 148.

EARLY BLIGHT (Cercospora apii). Celery growers have experienced much difficulty in growing the crop in North Carolina because of the Cercospora spot. The Golden Self Blanching varieties are a total loss in some plantings. The coarser green varieties are also badly diseased. Heavy spraying with Bordeaux mixture has been only partly successful in combating the disease. The loss for 1929 is estimated at 5 per cent. (R. F. Poole).
P.D.R. pages 116, 121, 157, 163.

ROOT KNOT (Caconema radicicola). In North Carolina the effect of the disease on celery is so severe that stunting, yellowing, and death are often the results. Several reports complaining of losses due to the nematode have been received from areas where an attempt is being made to grow the crop commercially. The loss for the State is estimated at 10 per cent. (R. F. Poole).
P.D.R. page 27.

TRENCH DECAYS (Bacillus carotovorus, Sclerotinia sclerotiorum, Botrytis sp.) caused a loss in Pennsylvania estimated at 10 to 15 per cent. The loss from this cause is correlated rather directly with warm winter weather. Storage of celery in modern cold storage houses is coming more and more into practice near Philadelphia. The satisfactory results in preventing rots and shrinkage promises a means of overcoming the great storage losses known in the past. (W. S. Beach).

P.D.R. pages 116, 163.

BACTERIAL BLIGHT (Bacterium apii). P.D.R. page 116.

CRACKED STEM (non-par.). P.D.R. page 157.

LATE BLIGHT (Septoria apii). P.D.R. pages 116, 121, 157, 163.

RUST (non-par.). P.D.R. page 163.

EGGPLANT

WILT (Verticillium albo-atrum) is prevalent in many places where eggplants are being grown commercially. In some of the older sections it is the most important disease and is rendering the crop unprofitable. During the year it was reported to the Survey by Le Clerg (39, p.4) from Colorado for the first time. From 20 to 25 per cent of the plants in a few acres were affected. The New Jersey Agricultural Experiment Station reports that tests of a large collection of varieties from foreign countries have failed to show any prospective resistant types.

BLACK SHANK or BENDING-OFF (Phytophthora nicotianae Breda de Haan) of seedlings occurred in Porto Rico in 1928 and 1929. It was found for the first time in September, 1928. (J. A. B. Nolla).

BLIGHT (Phomopsis vexans), MOSAIC (virus), P.D.R. page 155. (Reports from Texas.).

LETTUCE

YELLOWS (aster yellows virus), earlier spoken of as Rio Grande disease, rabbits' ear, and white heart, was reported from New Hampshire, New York, New Jersey, Delaware, Pennsylvania, Wisconsin, and Texas, in 1929. In New Hampshire about 50 per cent of plants allowed to go to seed were observed to be affected. In New York it seemed to be more severe than usual. Early lettuce is not usually severely affected, but in 1929 the yields of both early and late crops were much reduced. In Pennsylvania, on the other hand, where yellows causes from 5 to 50 per cent loss of the fall crop annually, much less than usual was noted. In Wisconsin it was noted especially in plants adjacent to affected asters.

P.D.R. paged 116, 149.

SLIMY ROT (bacterial). Brown (8) reports slimy rot to be an important field, transit, and storage disease of head lettuce in Arizona.

BOTTOM ROT (Corticium vagum). P.D.R. pages 95, 115.

DOWNY MILDEW (Bremia lactucae). P.D.R. page 116.

DROP (Sclerotinia spp.). P.D.R. pages 95, 116.

MOSAIC (virus). P.D.R. pages 95, 116.

TIPBURN (non-par.). P.D.R. pages 59, 116.

WILTS (undet.). P.D.R. pages 116, 140.

NEW ZEALAND SPINACH

ROSETTE (?) was reported from Marion County, Indiana, by M. W. Gardner. He stated that it had the appearance of being a virus disease.

OKRA

WILT (Verticillium albo-atrum) was severe in a few fields where okra had not been grown before. One field was observed which had a poor but wilt-free crop of okra the year before. The soil in this field was extremely acid (PH 3.9-4.0). In 1929 the same field was limed and planted to okra again and gave an excellent wilt-free crop. (C. M. Haenseler).

LEAF SPOT (Cercospora sp.), WILT (Fusarium sp.). P.D.R. page 43. (Reports from Georgia.)

ONION

YELLOW DWARF (virus), which was found in Iowa for the first time in 1928, was much less severe in 1929 because growers in the Pleasant Valley district indexed their sets (28) before planting. (R. H. Porter).

PINK ROOT (Phoma terrestris Hansen). During the year Hansen (23) has presented evidence that Phoma terrestris is the cause of pink root in California and also in other States. Inoculation experiments with several species of Fusarium seem to show that these act as secondary parasites and hasten destruction of the host but are not the primary cause of the disease.
P.D.R. page 117.

PURPLE BLOTCH (Macrosporium porri Ell.). Angell (3) points out that this fungus is the primary cause of the widely distributed disease which has frequently been attributed to M. parasiticum (M. sarcinula parasiticum.) His work has shown that the latter fungus is a secondary invader. He considers Alternaria allii Nolla to be the same as M. porri.

BULB DECAY (Fusarium sp.). What appears to be a new disease of stored onions was reported from Colorado by F. L. Wellman (67).

DOWNY MILDEW (Peronospora schleideni). P.D.R. pages 95, 117.

SMUT (Urocystis cepulae). P.D.R. pages 95, 117.

NEMATODE (Tylenchus dipsaci). P.D.R. page 9.

PEAS

WILT (Fusarium orthoceras var. pisi). Linford (40) considers this disease as second in importance only to root rot (Aphanomyces) and in some sections as the most important disease of the crop. In 1929 it was reported to the Survey only from Wisconsin and Minnesota. In the former State it was estimated that a loss of 4 per cent occurred on account of it, and in some fields the percentage of infection was as high as 50. Work on the selection and breeding of resistant canning peas in Wisconsin shows promise.
P.D.R. 73.

ROOT ROT (Aphanomyces euteiches). One of the principal diseases responsible for the very low yield and frequently poor quality of canners' peas in New York was Aphanomyces root rot. It was expecially destructive in the early peas as a result of wet weather immediately preceding and just following plantings. (H. H. Whetzel). The loss in New York was reported at 20 per cent by J. G. Horsfall.

In New Jersey a record-breaking high temperature period during the first week of April caused an unusually early infection. General infection evidently occurred during this warm period since the advanced stage of the disease with abundant mature oogonia was observed on May 3. The application of commercial fertilizers, 1000 to 1600 pounds per acre, reduced losses from root rot as in former years. On infested soil 1600 pounds of 4 - 8 - 5 increased the yield 206 per cent. (C. M. Haenseler)
P.D.R. pages 42, 93.

BLIGHT (Mycosphaerella pinodes). P.D.R. page 93.

ROOT ROT (Fusarium martii). P.D.R. page 73.

ROOT ROT (various organisms). P.D.R. page 59.

PEPPERS

POD ROT (Phytophthora omnivora). A trace occurred in Cumberland County, New Jersey. The disease was observed for the first time in 1928 when considerable fruit rot resulted. (Dept. Plant Path.)

MOSAIC (virus), SOUTHERN BLIGHT (Sclerotium rolfsii). P.D.R. page 155. (Reports from Texas).

RHUBARB

MOSAIC (unknown cause). What seems to be a mosaic of rhubarb has been under observation for a number of seasons in a field at Bustleton, Pennsylvania. The disease causes stunting, mottling of leaves, and finally death of the plants. It is spreading, causing dead areas in the field. It does not appear to be transmitted by contact. (W. S. Beach).

SALSIFY

YELLOWS (aster yellows virus) was reported from Maryland, Pennsylvania, and Wisconsin during 1929. This seems to be the first year that it has been recognized as a naturally occurring disease of this host. On the other hand, it has been produced experimentally by transfer of the leafhopper, Cicadula sexnotata, from diseased asters to salsify, and visa versa (36). The occurrence in Wisconsin was on salsify planted next to a plot of diseased asters. The effect of yellows on salsify is shown in figure 3.P.D.R. pages 139, 174.

WHITE RUST (Albugo tragopogonis). P.D.R. page 157.

DISEASES OF SPECIAL CROPS

COTTON

ROOT ROT (Phymatotrichum omnivorum). This disease has been known to occur in Texas, Oklahoma, New Mexico, Arizona, and California. In 1929 specimens of diseased cotton from Little River County, Arkansas, were identified by V. H. Young as being affected with Phymatotrichum omnivorum, and the diagnosis was confirmed by B. F. Dana. Apparently this is the first definite report of the disease in Arkansas although its presence there has been suspected for a number of years.

King and Loomis (35) report the discovery of a sclerotial stage of the fungus, with characters that would enable it to live through the winter or through long periods in the field without a supply of food.

P.D.R. 74, 98.

BLIGHT (Ascochyta gossypii). During the latter part of June and early July, an outbreak of this disease occurred in western South Carolina and northern Georgia. In South Carolina the disease looked as if it was going to be very serious for a time. Most fields examined in the area of occurrence showed a considerable number of dead plants. The worst case noted showed the disease on every plant, either leaf, petiole, or stem, and 4 per cent of the plants were dead. In Georgia, severe loss occurred in many fields in the northermost counties. Many fields were observed where the tops of the plants had been killed, but new shoots were sprouting from the base. This is the first authentic report of the occurrence of this disease in Georgia. With the termination of the rainy period in early July, the disease subsided and no further losses were reported.

Ascochyta blight was first reported from Arkansas in 1920 (19), 1921, and 1922, and in occasional years since that time. In 1924 it was reported from Virginia, North Carolina, and South Carolina, in which area there was an outbreak early in the season correlated with rainy weather. In 1925 it was first reported from the States of Mississippi and Alabama. These, together with the present Georgia report, constitute all the States of known occurrence.

P.D.R. pages 74, 88.

WILT (Verticillium albo-atrum) was reported for the first time from California by Shapovalov and Rudolph (54), who found it only in the southern San Joaquin Valley. The first diseased plants were observed in September, 1927, in a field which in the spring of that year had been planted with potatoes. The evidence seemed to indicate the introduction of the fungus with the seed potatoes in the spring of 1927.

Apparently the first report of this fungus occurring naturally on cotton is that of Sherbakoff (55) who found it in September 1927, on plants from Lake

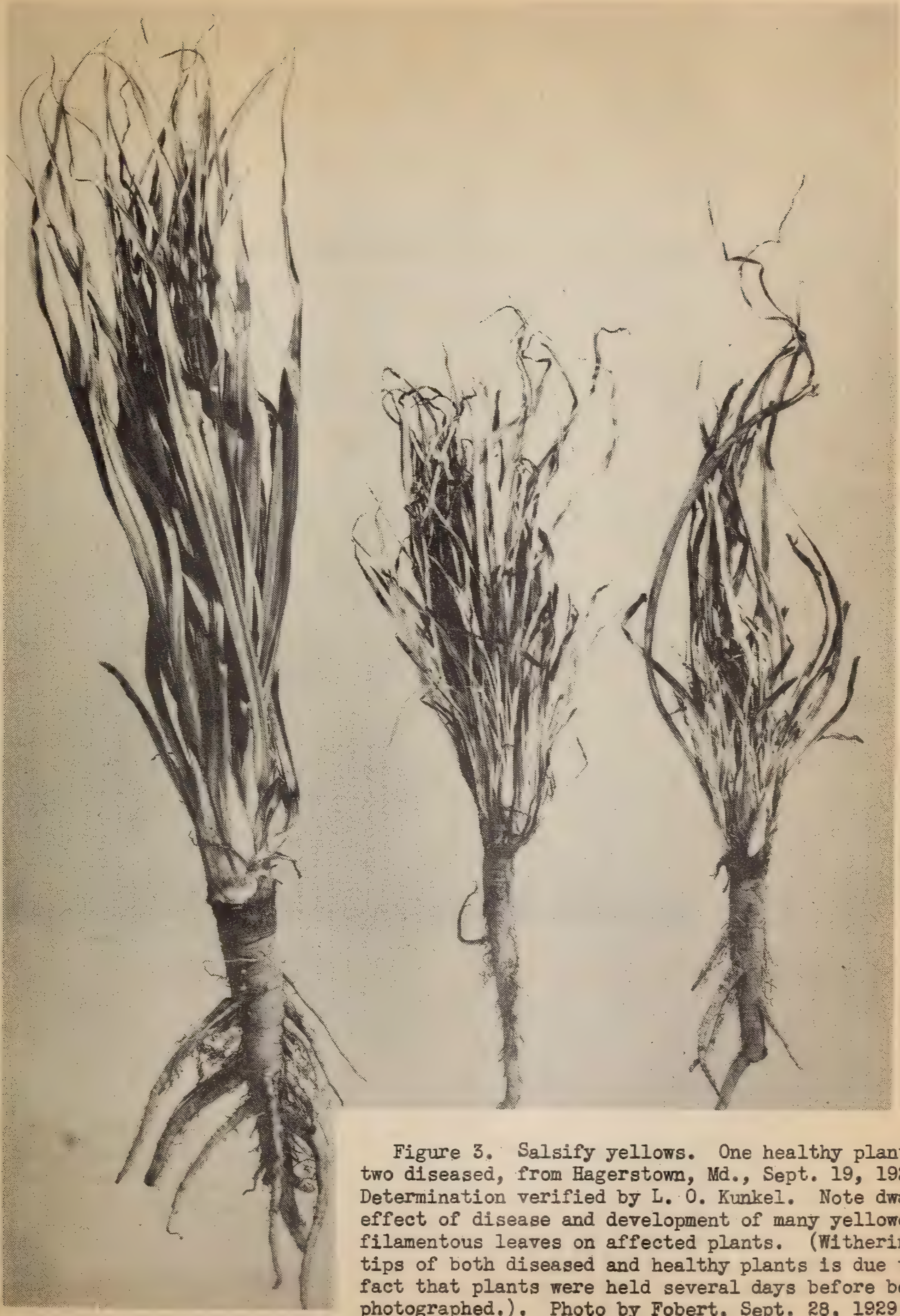


Figure 3. Salsify yellows. One healthy plant and two diseased, from Hagerstown, Md., Sept. 19, 1929. Determination verified by L. O. Kunkel. Note dwarfing effect of disease and development of many yellowed, filamentous leaves on affected plants. (Withering of tips of both diseased and healthy plants is due to the fact that plants were held several days before being photographed.). Photo by Fobert, Sept. 28, 1929.

County, Tennessee. Since that time it has been found to be rather widely distributed and somewhat of a problem in the "gumbo" soils along the Mississippi River.

V. H. Young reported the collection of a few specimens in the northeast corner of Arkansas in 1929. So far as could be determined, however, only very little damage resulted.

P.D.R. page 158.

WILT (undet.). A new cotton wilt has been described by Taubenhaus, Ezekiel, and Rea (61) during the year. It was first brought to their attention in 1927 from Ellis County, Texas, where one field was showing 60 per cent loss. Since then they have found what appears to be the same disease in El Paso and Brazos Counties. Therefore a wide distribution in Texas is indicated, as these three counties are widely separated.

The symptoms of this wilt resemble the common Fusarium wilt to some extent but there are certain very marked differences which the authors describe. Another major point of difference is that this new disease occurrs on heavy and alkaline soils, whereas the common Fusarium wilt in Texas occurs on sandy and acid soils.

Several fungi are associated with the disease but their pathogenicity has not been determined. A similar cotton trouble has been described by Fahmy as occurring in upper Egypt.

OTHER DISEASES. P.D.R. pages 43, 74, 91, 98, 149, 158, 194.

TOBACCO

MOSAIC (virus) is probably the commonest and most widespread of the tobacco diseases. Exact information as to the extent to which it injures tobacco has not been available, but McMurtrey (43), after conducting experiments for three years in southern Maryland, has reported that both the yield and quality are very adversely affected, especially when infection takes place soon after transplanting. In the three-year tests the yield of tobacco inoculated at transplanting time was reduced on the average 30 to 35 per cent, and the gross value of the crop per acre more than 55 per cent. The later the infection the less the injury, but even when inoculated at topping time the quality of the leaf was considerably lowered.

P.D.R. pages 89, 99, 137.

WILDFIRE (Bacterium tabacum) was the cause of some trouble in seed beds in Massachusetts, Pennsylvania, Maryland, and Wisconsin. In the last-named State, heavy infection was observed in a few beds but they were destroyed. Wildfire is only known to occur on 20 farms in Wisconsin. In Virginia and North Carolina it was of only very slight importance. As a field trouble it appeared not to be of consequence in any of the States.

Johnson (32) concludes that wildfire is not likely to be a serious menace to tobacco production as was feared earlier. As far as the individual grower is concerned the potential danger is still large but the likelihood of sufficient crop injury to make the culture of tobacco hazardous in any district seems very small. Fairly reliable methods of prevention are available.

P.D.R. pages 4, 99, 137.

ANGULAR LEAF SPOT (Bacterium angulatum). The Middle Atlantic States from Maryland to South Carolina, and also Wisconsin, reported considerable damage from this disease. In North Carolina it was rather widespread and probably more important than any other tobacco disease in the State. Four per cent reduction in yield and 4 per cent loss in grade was estimated from North Carolina.

Valleau (64) is of the opinion that angular leaf spot is not the same as blackfire. The former is bacterial while the latter is considered to be nonparasitic and associated with nutritional and seasonal conditions. Tobacco pathologists should make an effort to obtain further evidence following this suggestion.

P.D.R. pages 89, 99, 137.

BLACK ROOT ROT (Thielavia basicola). This disease is becoming of greater importance in North Carolina, probably due to the recently and widely used lime products for correcting magnesium deficiency diseases, in which the soil reaction has been changed to neutral or alkaline, and is therefore more favorable for infection. Heavy infection was reported in the Piedmont. As yet the disease has not been reported in the coastal area. Loss, 3 per cent. (R. F.Poole).

In Massachusetts, alfalfa following tobacco on infested soil showed no black root rot. In Pennsylvania the disease was said to be increasing and the suggestion made that resistance on the part of some strains appears to be lost. In Wisconsin injury seems to be gradually diminishing annually, apparently due to increase in the use of resistant strains. A report from Porto Rico mentioned occasional occurrence, but the distribution was limited to a section where the temperature is lower than in the other tobacco sections.

P.D.R. page 137.

BROWN ROOT ROT (undet.). Massachusetts farmers are avoiding brown root rot by not planting tobacco on brown root rot soil or after predisposing crops like corn or timothy. (W. L. Doran).

An unusually large amount of this trouble seems to be present in Wisconsin this year. (James Johnson).

P. D. R. page 137.

FRENCHING (undet.). P.D.R. page 89.

BACTERIAL WILT (Bacterium solanacearum). P.D.R. page 99.

RING SPOT (virus). P.D.R. page 99.

SUGAR CANE

MOSAIC (virus). The introduction and increased use of resistant varieties is rapidly reducing the prevalence of and loss from mosaic in the cane-producing sections of our Southern States and is re-establishing the industry which was gradually going downward (7). In both Louisiana and Mississippi, mosaic infection is general in fields of the old, susceptible varieties but the acreage of these is being replaced with the newer, resistant sorts.

RING SPOT (Leptosphaeria sacchari). Specimens of six different cane varieties affected with ring spot were received from B. A. Bourne of Florida. Although this disease has been mentioned as occurring in the United States before, these are the first specimens to be filed with the Survey.

P.D.R. page 167.

SUGAR BEET

The following report on sugar beet diseases is contributed by G. H. Coons and A. W. Skuderna.

CURLY-TOP (virus), which normally is limited to the area west of the Rocky Mountains, aside from occasional, sporadic cases in the adjoining states, caused much less damage in 1929 than in the previous season. This decrease has been attributed by entomological experts to failure of the vector (Eutettix tenella) to overwinter and the consequent smaller numbers entering the fields.

Eastern Colorado showed, as usual, a trace. In western Colorado, the damage was placed as "slight". This area shows considerable damage about three years out of five. The Montana area reported practically no loss from curly top. In Utah, which normally suffers severe injury about two years out of five, there was only slight damage. The loss in Idaho has been placed at 2 per cent for the entire area, but the situation there is difficult to estimate because some sections where beet culture still persists are near to natural breeding areas and in such cases the curly-top incidence is very high, almost leading to crop failure In California the loss was slight but it must be noted that the areas at present used for sugar-beet production have been restricted to the practically curly-top-free zones; many factories are standing idle. The section about Chino, California, probably suffered 10 to 15 per cent loss. In the new region opening up around Sacramento in the Delta Region there were traces of loss.

SUGAR-BEET NEMATODE (Heterodera schachtii). Soil infestation with the sugar-beet nematode is limited to the western United States. The infested area is approximately the same as before but the situation in general has improved greatly due to curtailment in use of infested land and to the system of crop rotation enforced by nearly all companies. In spite of care, however, some fields in all districts are put in nematode-infested land and sugar beets are allowed to follow sugar beets, in which case nematode loss is severe.

Estimates will place the loss for Colorado and California at approximately 2 per cent, with probably similar figures safe for the Utah and Idaho areas. This figures for loss represents a striking contrast to the situation 5 or 10 years ago, when the infested area in which the growing of sugar beets was actually being attempted mounted into thousands of acres. (c.f. previous plant disease survey reports).

LEAF SPOT (Cercospora beticola), caused, in general, less damage in 1929 than in certain previous seasons, being checked in the extreme eastern section by the drought of long duration. In northern Iowa and southern and eastern Minnesota, the loss, taking into consideration both sugar and tonnage effects, was from 3 to 5 per cent, with the probability that the higher figure more nearly represents the situation. In northern Colorado also, the loss can be placed for this at from 3 to 5 per cent, which was fairly high for that area, since severe leaf-spot damage ordinarily is avoided. The Arkansas Valley of southern Colorado, which suffers severely from leaf-spot in about 8 years out of 10, suffered a loss from 5 to 10 per cent, taking into consideration both sugar and tonnage reductions The Nebraska area showed about a 3 per cent leaf-spot loss.

ROOT ROTS, including rots in storage piles, vary with locality and almost from field to field. Many organisms are concerned, and methods of handling play an important role in determining incidence of these diseases which are to be attributed to Rhizoctonia sp., Phoma betae, and various Fusaria.

The Nebraska area reported more root rot damage than any other, the loss there being estimated at 2 to 3 per cent.

STORAGE ROTS, which in part at least are connected with the root rots which start in the field and continue when the beets are in the storage piles, were reduced to a minimum in 1929, due to the cold weather during the storage period. There were severe freezing losses in all the sugar-beet areas due to early frosts and delayed harvests.

DAMPING-OFF, caused by a number of pathogens, was severe in Michigan where the stand was reduced 30 to 40 per cent. It was almost impossible to find a sugar-beet field with a satisfactory stand. The same situation held in Ohio and Indiana. This seemed to be associated with the unfavorable wet spring conditions, Iowa, Minnesota, Colorado, and Utah had good stands and a minimum of damping-off. Idaho had occasional fields where damping-off loss was found. California showed damping-off in very early plantings and many fields had to be replanted. In Washington heavy losses occurred, but probably less than in previous years.

DOWNY MILDEW (Peronospora schachtii), has so far only been reported from California, and in that State has been limited to the Fog Belt near the coast. In 1927 and 1928 there was a very serious loss from mildew, attributable to the weather in February and March where sunshine was less than normal and rainfall in the coastal area heavy. The 1929 season showed only a trace of mildew and affected plants pretty largely outgrew the early attack.

HOPS

DOWNY MILDEW (Pseudoperonospora humuli) was reported last year from New York State, but the collaborator stated that it was not reported there in 1929. Further information about the occurrence in British Columbia is given by Salmon and Ware (52), who state that the fungus agrees with that which has been so destructive in Europe during recent years. They suggest that it may have been imported into Canada in or on hop sets obtained from Europe.

Oregon has recently restricted the entrance of hop roots from other countries and States.

This disease was seen in Japan as early as 1905, where it was evidently native on wild hops. It was collected on wild hops in Wisconsin in 1909, and at frequent intervals since that year. In England it was first noticed in 1920, but iw was not until 1925 and 1926 that it became conspicuous. Almost simultaneously it was found in other countries of Europe, thus, Germany in 1924; France, Belgium and Russia in 1925; and numerous others in 1926.

CROWNGALL (Bacterium tumefaciens). At Independence, Oregon, a 35-acre plot has about 10 per cent of the plants affected this year. The grower says that the leaves become yellow early the first year that noticeable symptoms are seen, the next year the plants are much dwarfed, and the third year they are usually gone. We do not know how many years this may be after infection first takes place.

This is the first report of crowngall on hops from Oregon. (S.M. Zeller)

GOLDEN SEAL

WILT (Fusarium sp.), which has been causing considerable concern to the golden seal growers in northern New York in the past few years, was found in two gardens, in one of which it was very destructive. (H. H. Whetzel.)

DISEASES OF TREES

CONIFERS

CEDAR BLIGHT (*Phomopsis juniperovora*). (With figure 4). Cedar blight, primarily a disease of *Juniperus virginiana* seedlings, is one which is known to practically every grower of nursery cedars. The disease is not a new one, for since 1896 it has been recognized as destructive. Cedar blight is now thoroughly established throughout the nurseries of the middle west where red cedar is grown on a commercial scale. It is also to be found in nurseries and ornamental plantings along the Atlantic seaboard where in certain instances it has been definitely known to have been introduced from the middle western region. A strain of the fungus has been isolated by the author from ornamental *Cupressus funebris* in California.

Phomopsis juniperovora Hahn is now reported from the following states: Alabama, Connecticut, District of Columbia, California, Florida, Illinois, Iowa, Kansas, Kentucky, Louisiana, Maryland, Missouri, Nebraska, New Jersey, New York, Minnesota, North Carolina, Ohio, Pennsylvania, Rhode Island, Tennessee, and Wisconsin.

Cedar blight has been reported by the author and other investigators upon the following hosts, which are all confined to the Cupressaceae:

Juniperus chinensis, chinensis Pfitzeriana, communis, communis montana, excelsa stricta, horizontalis (J. prostrata), lucayana, pachyphloea, procumbens (J. chinensis procumbens), sabina, sabina tamariscifolia, scopulorum, scopulorum argentea, squamata meyeri, virginiana, virginiana cannartii, virginiana plumosa, virginiana tripartita.

Cupressus arizonica, benthami, funebris, glabra, goveniana, macrocarpa.

Thuja occidentalis, orientalis, plicata (T. gigantea).

Chamaecyparis lawsoniana (Cupressus lawsoniana), obtusa, pisifera plumosa, pisifera squarrosa.

A *Phomopsis* species very closely related to *P. juniperovora*, and which is widely distributed among nursery and ornamental stock both in the United States and Europe, may be confused with the cedar blight organism. This species has been identified by Hahn (22) as P. occulta Trav., (Hahn, G. G.) the imperfect stage of Diaporthe conorum (Desm.) Niessl (syn.: *D. occulta* (Fckl.)Nke.: *D. pitya* Sacc.). Certain strains of *P. occulta* may be regarded as slightly parasitic; occasionally this fungus may cause a definite canker or die back on the main stem and laterals. The host genera upon which *P. occulta* has been found either as a saprophyte or parasite, include: Abies, Cryptomeria, Cupressus, Juniperus, Larix, Picea, Pinus, Pseudotsuga, Secuoia, Taxodium, Taxus, Thuja, Thujopsis, and Tsuga.

Of the genera attacked Juniperus is undoubtedly the most susceptible, although considerable loss has been experienced by certain nurseries in the genus Cupressus. The virginiana types and varieties are decidedly prone to the disease, particularly seedlings from seed collected in the Platte River region. *J. sabina* and varieties, together with certain varieties of *J. chin-*

ensis are also to be regarded as quite susceptible. Certain species and varieties, however, have been observed to show varying degrees of resistance. *J. virginiana keteleeri* has been reported New Jersey Agr. Exp. Sta. Nursery Disease Notes 1 (1): 1-6. July 1928, mimeographed) as one apparently highly resistant. *J. chinensis* has also been considered as a species showing a good deal of resistance. *J. excelsa stricta* has been regarded heretofore as immune; despite a single observation of blight on this species in New Jersey by Dr. R. P. White it may be considered as one exceedingly resistant.

During 1929, cedar blight was reported generally throughout New Jersey but it was much less prevalent than in 1928. In southeastern Minnesota where an extremely wet season was experienced, the disease was very prevalent; in Ohio the disease was observed throughout all the nurseries of the state to the extent that nurserymen were experiencing a marked loss of cedar stock. (Glenn Gardner Hahn)

THE EUROPEAN LARCH CANKER (*Dasyscypha willkommii* (Hartig) Rehm) has long been known in Europe and is one of the most prominent and most studied fungus diseases in European forests. It occurs throughout the range of the European larch, whether natural or planted, and in many places the growing of larch has in consequence been given up as unprofitable. Although American forest pathologists have been on the lookout for this disease for many years, it was not discovered until 1927. Previous reports of the fungus in this country appear to be based on errors of identification. There is now no doubt, however, that the disease found at Hamilton, Massachusetts, and in that general vicinity is the true larch canker of Europe. It has been found in only a limited area in Massachusetts and is well under control. Although there has been extensive scouting since 1927, the disease has not been found on larch outside of this limited territory.

The larch canker has been reported in Europe on other hosts, particularly Douglas Fir and Sitka Spruce, but we have so far been unable to find evidence that these species were seriously damaged. However, in the same locality in Massachusetts where the larch canker occurs another Dasyscypha canker was found seriously affecting planted Douglas Fir and Western Yellow Pine. At first the fungus associated with this trouble was taken to be *Dasyscypha willkommii*, but further study indicates that it is not this species. Whatever this disease on Douglas Fir is, and whatever its origin, there is no doubt that it seriously affects the trees, and pending further evidence it must be regarded as a serious menace to native as well as planted Douglas Fir. In addition to its occurrence in the general vicinity of Hamilton, Massachusetts, this disease has been found at Groton, Massachusetts, some 40 miles to the West, and in Rhode Island near the town of East Greenwich. Despite general scouting no occurrences of this disease have been found outside the localities mentioned. (Haven Metcalf).

ROOT AND BUTT ROT (*Polyporus circinatus* Fr.) was observed on living western white pines, *Pinus monticola*, in northern Idaho. Other conifers including Engelmann spruce, *Picea engelmanni*, Douglas fir, *Pseudotsuga taxifolia*, western hemlock, *Tsuga heterophylla*, and western larch, *Larix occidentalis*, in the West; and *Picea mariana* in Minnesota have also been found affected. It has also been reported from Canada. (31)

BALSAM FIR (Abies balsamea)

BUTT-ROT (*Polyporus balsameus* Pk.) Hubert (30) reports this rot on balsam fir, *Abies balsamea*, from Wisconsin and Minnesota. The fungus was first reported from the Adirondack Mountains. It has also been reported from Canada. It seems to be a serious factor in pulp stands, especially following attacks of the spruce bud worm.

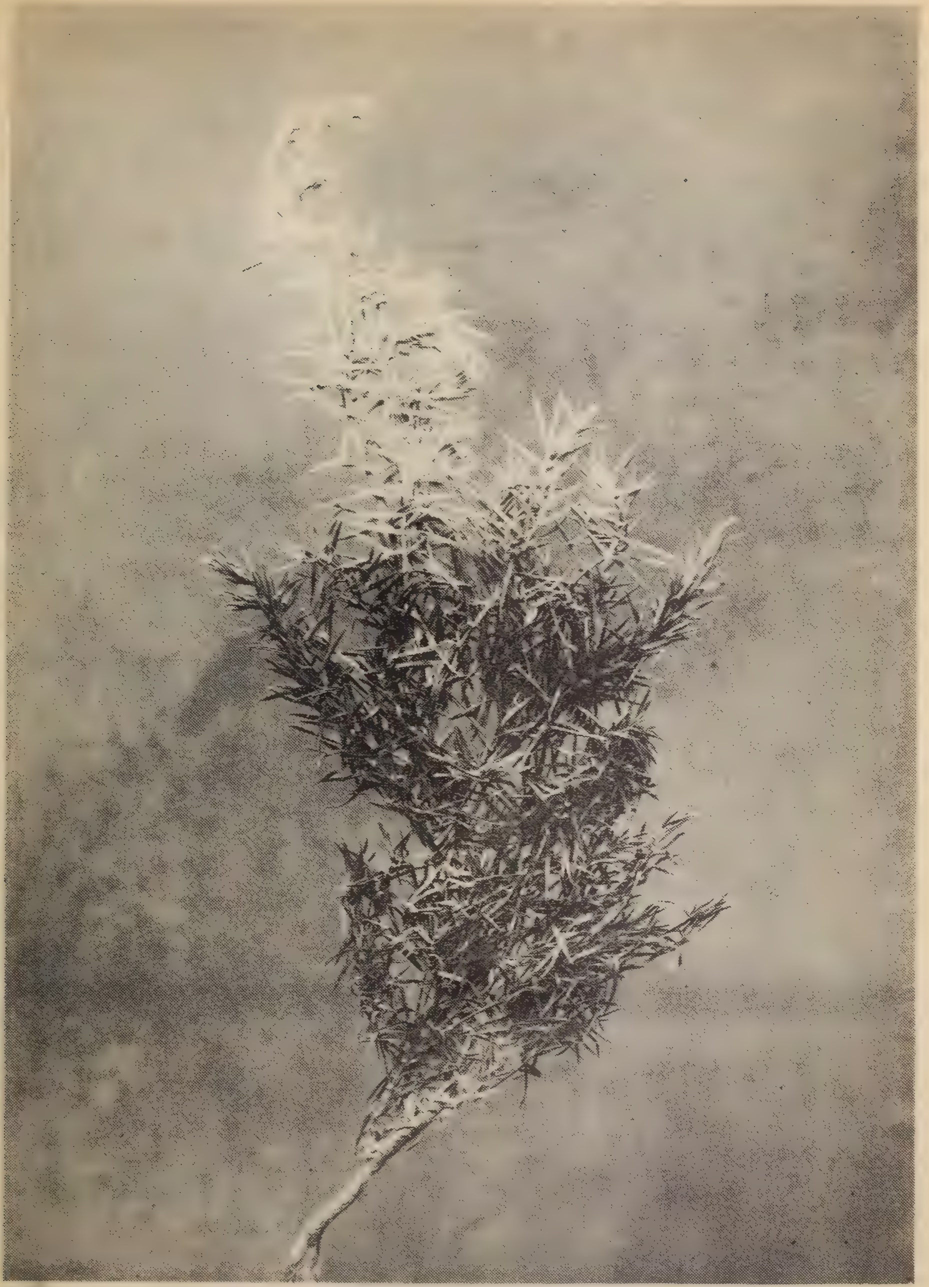


Figure 4. One-year old seedling of Juniperus virginiana showing terminal growth attacked by Phomopsis juniperovora. Photograph furnished by G. G. Hahn

PINES (Pinus spp.)

WHITE PINE BLISTER RUST (Cronartium ribicola) White pine areas in New England and New York totaling 919,755 acres were cleared of Ribes in 1929. Since 1918, control of the rust has been established on 7,757,140 acres of land at an average cost of 20.4¢ per acre. The total number of Ribes bushes destroyed in the Northeastern and Lake States in 1929 amounted to 7,936,245. The forests in this region contain 8,221,167 acres of white pine of sufficient value to warrant protection.

Nurseries in infested regions which produce white pines for ornamental and forestry purposes have been encouraged and aided in establishing a Ribes-free protective zone around their premises to insure the production of white pine planting stock free from blister rust. In this work, good progress has been made in several of the cooperating States. In Connecticut eleven nurseries now have a Ribes-free area of 1,500 feet, and are surrounded by a mile zone within which all Ribes nigrum have been removed.

In Pennsylvania the blister rust on pine spread westward and southward, infections being found in the Alleghany National Forest and in Franklin County near Mont Alto in Biesecker's Gap, only five miles north of the Maryland State line. While blister rust was known to be present prior to 1929 on white pine in 10 counties, by the end of 1929 it had been found on pine in 17 additional counties. Exceptionally severe pine infection is found in Cameron and Potter Counties.

In Marquette and Dickinson Counties, in the Upper Peninsula of Michigan blister rust was found to have spread to white pine, the infections dating back to 1915.

In Wisconsin there was some spread of infection in the eastern part in Shawano, Oconto, Forest and Waupaca Counties, while in the western part there was considerable spread in Dunn, Chippewa and Barron Counties.

In Minnesota new infections were found on pine at Mora, Afton, Duluth, Sunrise and Coleraine.

Black currant eradication has been carried on in several of the Eastern States. In Michigan the work was done in 7 counties, 4 of which were completed, viz: Cheboygan, Missaukee, Newaygo and Roscommon. The total number of Ribes nigrum destroyed was 5,461. In Rhode Island some 5,703 Ribes nigrum bushes were destroyed in 22 townships. After August 20, 86% of these bushes in Rhode Island showed infection.

In the Western States the most striking events were the discovery of pine infections in northern Idaho dating back to 1923, the spread of the rust on Ribes in Curry County, Oregon, the extreme southwestern county in the State, and the enlargement of the known infection area in western Montana.

During the summer of 1929, large-scale application of stream-type eradication was carried out in northern Idaho thus protecting a total of 21,500 acres of white pine of the Clearwater Timber Protective Association, and 57,010 acres of white pine type of the Potlatch Timber Protective Association. Ribes eradication was accomplished by the spraying of chemicals and by hand pulling. The total bushes destroyed by spraying is impossible to estimate but the bushes which were hand pulled number 1,034,517.

In California extensive Ribes eradication experiments were carried on, particularly in the Plumas National Forest, the number of acres worked being 3,660 and the bushes removed 472,406. (R. G. Pierce.)

BLISTER RUST (*Cronartium comptoniae*) is a serious disease of pitch and hard pines in eastern United States. During the past year Lachmund (37) reported it as indigenous in the Pacific Northwest. It has been found on both *Pinus contorta* and the alternate host (*Myrica gale*) in British Columbia and Washington.

WOODGATE RUST (*Peridermium* sp.) is a gall rust belonging to the form-genus Peridermium and occurring on Scotch pine (*Pinus sylvestris L.*) It is established over two extensive areas in New York, Clinton, Franklin, and Essex counties in the Northeastern part of the State, and Oneida, Lewis, and Herkimer counties in the central part. It is also reported from the Provinces of Ontario, Quebec, and Nova Scotia in Canada. It spreads directly from tree to tree without any alternate host. It attacks susceptible trees with great virulence, but many individual trees are resistant. Scotch pine is not a timber tree of major importance, and at the present time is probably more utilized in the State of New York than anywhere else, particularly for planting in sandy barren soil in the Black River valley. It has long been planted as a shade tree throughout the United States.

This rust has not yet been identified. We call it Woodgate rust, because it was first (1925) found at Woodgate, N. Y. Evidence to date indicates that it is a stranger in the country. It may have been present for a long time; it certainly has been confused with *Peridermium cerebrum* by some collectors, although the aecia are not cerebroid. It may possibly be one of the forms of rust native in the West and now passing under the name of Peridermium harknessii, but this is to some extent contradicted by the fact that galls of *harknessii* found on Scotch pine at Halsey, Nebraska, are different in shape from the Woodgate rust, and in California *harknessii* has not been observed to pass onto planted Scotch pine. If the rust is a form of *harknessii* that has found its way East, it might constitute a menace to the eastern hard pines, including the very valuable turpentine pines. If it is a stranger in the country, it is a potential menace to any hard pine, including not only the turpentine pines of the Southeast but the western yellow pine which ranges from Canada to Mexico.

Danger from the Woodgate rust lies in the following facts: (1) It is a Peridermium. Many species of this genus are virulent parasites. (2) Like the White Pine blister rust, it is a stem Peridermium - it attacks the trunk and branches of the tree. (3) It attacks susceptible trees with even greater virulence than the White Pine blister rust. A tree 15 feet high was found by actual count to have over 18,000 galls. (4) The Peridermiums which attack conifers usually attack all members of the group to which their particular host belongs. For example, White Pine blister rust is not confined to *Pinus strobus*, but attacks all 5-needle pines. The Woodgate rust might be expected to attack any hard pine. It has been shown by inoculations in the field or greenhouse that Woodgate rust can pass to the following pines:

P. canariensis	Canary Island Pine
P. caribaea	Slash Pine
P. densiflora	Japanese Red Pine
P. jeffreyi	Jeffrey Pine
P. muricata	Bishop Pine
P. nigra poiretiana	Corsican Pine
P. pinea	Stone Pine
P. ponderosa	Western Yellow Pine
P. radiata	Monterey Pine
P. sabiniana	Digger Pine
P. sylvestris	Scotch Pine
P. taeda	Loblolly Pine
P. virginiana	Virginia Pine

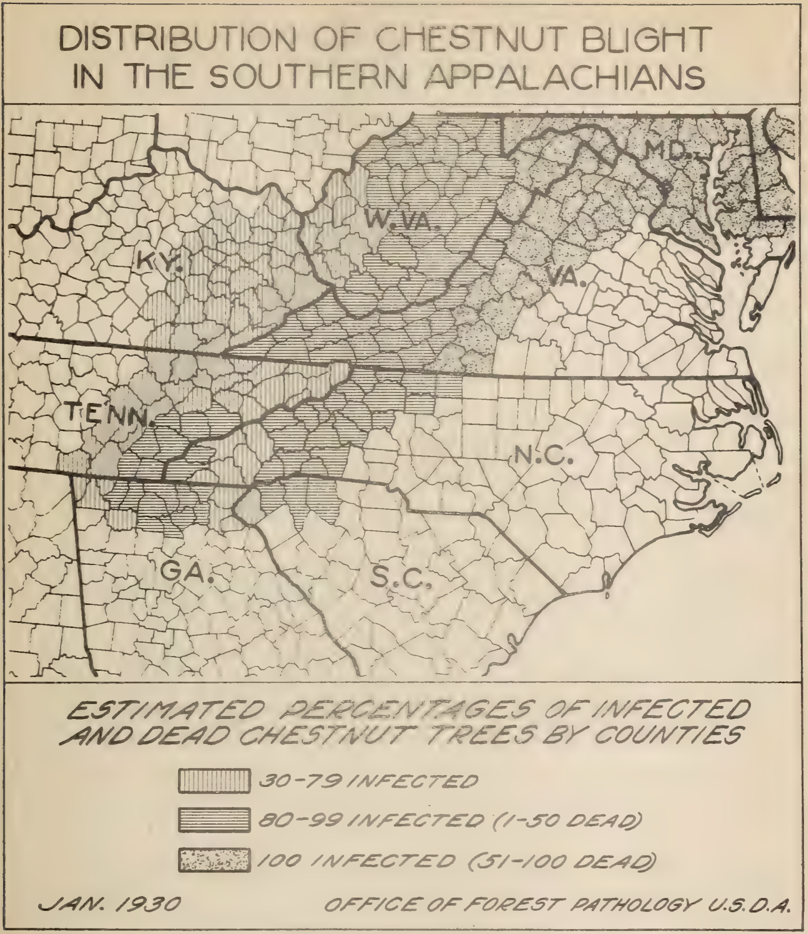

DISTRIBUTION OF CHESTNUT BLIGHT
IN THE SOUTHERN APPALACHIANS
MD.
W. VA.
KY.
VA.
TENN.
N.C.
GA.
S.C.
ESTIMATED PERCENTAGES OF INFECTED AND DEAD CHESTNUT TREES BY COUNTIES
30-79 INFECTED
80-99 INFECTED (1-50 DEAD)
100 INFECTED (51-100 DEAD)
JAN. 1930
OFFICE OF FOREST PATHOLOGY U.S.D.A.

Figure 5. Distribution of chestnut blight (*Endothia parasitica*) in the Southern Appalachians

Inoculations are in progress, and other hosts may be expected to be added to this list. (5) Any disease that is thriving outside of its natural habitat is potentially dangerous. The Woodgate rust is a stranger in its present range and is growing on an imported host. (6) The Woodgate rust is autoecious. This is a rare condition in the Peridermiums. The Woodgate rust will therefore be impossible to control by the method ordinarily used in controlling rusts, viz., destruction of the alternate host.

The prominent symptoms of Woodgate rust consist of galls and usually witches'-brooms. The galls may be scattered, or may occur as thickly as beads on a string. As a rule, the parts of the tree above a gall die sooner or later. In New York the aeciospores are produced in June, and cover the galls more or less thickly with a yellow powder. Federal Quarantine No. 65, effective November 1, 1928, and amended effective April 1, 1929, prohibits the shipment of the hosts of Woodgate rust from the infected areas in New York. Woodgate rust is not likely to find its way into other States otherwise than on nursery stock of Scotch Pine. Inspectors, pathologists, and foresters should look for galls on Scotch Pine everywhere. Differentiating Woodgate rust on any hard pine from other gall-rusts is a task for the specialist. (Haven Metcalf.)

CANKER (Dasyscypha fusco-sanguinea) was reported by Sillinger (59) as being common on western white pine (P. monticola) in the white pine regions of the Inland Empire of Montana, Idaho, Washington, and Oregon. It has many similarities to the white-pine blister rust and is confused with it.

HEART ROT (Lentinus lepideus Fr.) This species, well-known as a saprophyte, is reported by Wagener (66) as the cause of a heart rot of living Pinus ponderosa. P. contorta, P. lambertiana, and P. banksiana. The fungus on living trees seems to be fairly common in the Sierra Nevada in California. It has also been collected on living pines in Arizona and Montana in the West and in Minnesota and the District of Columbia in the East.

HARDWOODS

BLACK LOCUST (Robinia pseudacacia)

BROOMING DISEASE (virus.). Hartley and Haasis (25) have reported on this disease during the past year. It has been observed in Virginia, Maryland, Georgia, North Carolina, and Pennsylvania. In 1928 Archer (5, p. 352 and pl. 5) reported it from West Virginia.

CHESTNUT (Castanea dentata)

BLIGHT (Endothia parasitica). Estimates on the spread of the chestnut blight in 1929 were contributed by Government and State foresters, extension pathologists, county agents, and private parties. The accompanying map (figure 5), on which the percentages of infection are divided into three classes, shows that the lowest infection for any chestnut-producing county in the southern Appalachians was 30 per cent. The blight has been reported by W. D. Valleau as destroying chestnut on estates in the vicinity of Louisville, Ky., thus extending the limit of the disease in that State, 90 miles or more west.

F. C. Strong, of the Michigan State College, reported finding blight-infected American chestnuts between Jackson and Lenawee Junction, Michigan.

In the Plant Disease Reporter, Vol. XIII, No. 13, Nov. 15, 1929, G. F. Gravatt recorded the finding of chestnut blight at Gunter, Oregon. The infection was probably introduced from some of the Eastern States, and the few infected trees have been destroyed. (R. B. Clapper).

ELM (*Ulmus spp.*)

DUTCH ELM DISEASE (*Graphium ulmi*) was first found in Holland about twelve years ago. It now occurs throughout northern continental Europe and in the last two years has appeared in Great Britain. It is not known to occur in the United States, but on account of its great destructiveness in Europe, the rapidity of recent spread, and its potential importance to the United States, it is mentioned in this summary. Strict watch should be kept for this disease and suspicious cases reported, so that prompt action may be taken. Metcalf (45) has recently summarized the situation briefly before the fifth National Shade Tree Conference in Brooklyn, New York.

FRANGIPANI (*Plumeria acutifolia*)

RUST (*Coleosporium domingense*). A specimen of a rust which was defoliating a frangipani tree at Coconut Grove, Florida, has been identified as *Coleosporium domingense* (Berk.) Arth. (C. plumeriae Pat.). This seems to be the first report of this rust in the United States. It is known to occur on species of Plumeria in the West Indies, Guatemala, Peru, Panama, and Mexico. P.D.R. page 9.

MAPLE (*Acer spp.*)

ROOT KNOT (*Caconema* (*Heterodera*) *radicicola*) was reported to the Plant Disease Survey on broad leaf maple (Acer macrophyllum) for the first time. The occurrence was in Lane County, Oregon. P. D. R. page 174.

CROWN GALL (*Bacterium tumefaciens*) was reported on sycamore maple (*Acer pseudoplatanus*) for the first time to the Plant Disease Survey. It occurred in a Michigan nursery plot where slightly over 50 per cent of the trees were affected. The roots showed typical galls and also in many cases a hairy root condition.

SYCAMORE (*Platanus spp.*)

LEAF SPOT (*Stigmina platani* (Fckl.) was reported on the native sycamore, *Platanus racemosa*, in California by Apostolides (4). It had already been known on *P. orientalis* in that State.

WILLOW (*Salix spp.*)

BLIGHT (*Fusicladium saliciperdum*). This disease was first reported in the United States by G. P. Clinton (Plant Dis. Reptr. 11:87. Aug. 1, 1927), who found it causing serious damage around Norfolk, Connecticut. Previous to this it had been reported as occurring only in Germany, Holland, Scotland, and other European countries. Subsequent search in 1928 and 1929 has shown it to be of frequent occurrence in parts of the New England States, New York, and in the eastern provinces of Canada - Nova Scotia, Cape Breton Island, Prince Edward's

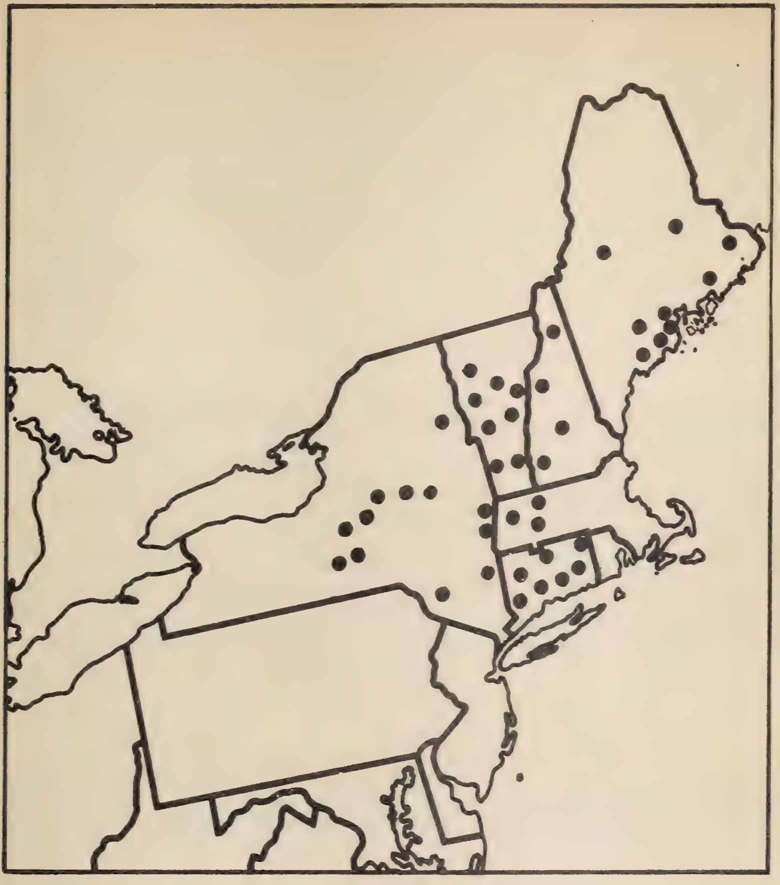


Figure 6. Occurrence of willow blight (Fusicladium saliciperdum) in the United States, as reported to the Plant Disease Survey, 1929. (Each dot represents a county where the disease has been collected or observed.).

Island, and New Brunswick. The observations and collections of scouting parties in 1929 considerably extended the known range of occurrence. On the accompanying map (figure 6) are indicated the counties from which the disease has been reported to date.

The disease is capable of causing severe damage. Hundreds of large trees have been killed and seriously injured in New England and in the Canadian Provinces the destruction seems to be even greater.

Many different species of willow are attacked. At least eight species have been found affected in Connecticut. There is considerable variation in the susceptibility of these different species, however. Thus, the large yellow-twigged willow, Salix alba var. vitellina, is most persistently and seriously injured; the white willow, S. alba, so far has been found attacked only rarely; the bayleaf willow, S. pentandra, seems somewhat resistant; while the weeping willow, S. babylonica, apparently is immune.

An excellent summary of the present situation has recently been given by Clinton (15).

P.D.R. 44, 61, 74, 75, 110, 142, 143, 160; also in P.D.R. 14: 77. 1930.

BLACK CANKER (Physalospora miyabeana). This fungus has been found commonly associated with the destructive leaf and twig disease caused by Fusicladium saliciperdum. Spaulding and Collins (Plant Dis. Reptr. 13: 142-144) report collecting it in Nova Scotia, New Brunswick, Quebec, Maine, New Hampshire, Massachusetts, Connecticut, and New York. According to Spaulding, the fungus seems to fruit naturally only on young twigs or sprouts. The 1929 season was so dry that there was little natural fruiting. However, in moist chambers, the Gloeosporium stage developed readily on suitably chosen twigs and sprouts.

Nattrass and Hutchinson (46) regard this as of considerable importance in England.

P.D.R. 142, 143.

DISEASES OF WOODY ORNAMENTALS

BOX (Buxus sempervirens)

DIE BACK. Every year numerous complaints of dying back of twigs and death of boxwood bushes and trees are received. In the majority of cases either one or both of two fungi are present on the affected leaves, namely, Macrophoma candollei and Volutella buxi. Occasionally other fungi are found. The exact role of these fungi, as well as the best means of prevention, seem to be very imperfectly known. In 1929 reports were received from the majority of the Eastern States, from Connecticut south to Mississippi and Arkansas.

CRAPE MYRTLE (Lagerstroemia indica)

POWDERY MILDEW (Uncinula australiana) was recorded in 1929 from the District of Columbia for the first time. The disease has been known in this country since 1924. Since that time it has spread to most of the Southern States, from the Carolinas southwestward to Texas.

LILAC (Syringa vulgaris)

BACTERIAL BLIGHT (Bacterium syringae). In 1926 C. O. Smith (56) called attention to a bacterial disease of lilac in California apparently caused by the same organism which causes citrus black pit and blast (Pseudomonas citriputeale). In 1928 Miss Bryan (11) reported the same lilac disease from Illinois where it had been collected by Anderson in 1925. The disease is known to occur in Germany (1891), the Netherlands (1899) and England (1908).

In 1929 what seems to be this same disease was reported to the Survey from New York, New Jersey, Mississippi and Washington.

BOTRYTIS BLIGHT (Botrytis sp.) which has been previously reported only from New England, New York, and the Pacific Northwest, was reported again from western Washington and what was thought to be the same disease was rather serious in some localities of western Oregon.

BLIGHT (Phytophthora syringae) has been known in Europe since 1905, but it was not until 1929 that it was reported from the United States when it was found in the District of Columbia, May 2. White (70) considers Phytophthora cactorum to be the cause of a blight of lilac, as well as of Rhododendron, in New Jersey.

P.D.R. page 27.

RHODODENDRON (Rhododendron spp.)

DIE-BACK (Phytophthora cactorum). Reported by White (70) as the cause of serious die-back of native and hybrid Rhododendrons.

WILT (Phytophthora cinnamomi). This fungus has been reported by White (70) as the cause of Rhododendron wilt.

ROSE (Rosa spp.)

INFECTIOUS CHLOROSIS (virus). The rose disease variously termed infectious chlorosis, mosaic, or yellows, has been identified on about 25 varieties of Hybrid Tea roses grown under glass in the following states: Massachusetts, New York, Pennsylvania, New Jersey, Illinois, Indiana, Iowa, Michigan, Wisconsin, Colorado, and Oregon. It has also been found on Manetti understocks in Oregon, Washington, and British Columbia, and on Manetti and Ragged Robin in California. It has been experimentally transferred to Rosa multiflora, but not to R. odorata.

Experiments have shown that the disease is transferred from infected to healthy plants by grafts and buds, and is perpetuated by the use of cuttings from diseased plants. Either the stock or scion may be diseased and cause infection in the other component.

Present indications are that rose stocks from the Pacific Coast have been the most frequent source of the disease in greenhouse roses in the East, but there are indications that foreign stocks also are sometimes infected.

Thorough roguing of infected plants has proved effective in practically eliminating the disease in greenhouse plantings, and in holding it well in check in plantings of understocks. (Freeman Weiss).

BLACK SPOT (Diplocarpon rosae). This common and destructive disease was reported from most all states east of the Great Plains area and from the Pacific Northwest. In general there seemed to be less than the usual damage, probably owing to dry summer weather, but in some states such as Missouri or Kansas it was of more than average destructiveness.

CANE BLIGHT (Leptosphaeria coniothyrium) and BROWN CANKER (Diaporthe umbrina). Both of these troublesome cane diseases were frequently reported in 1929. The former seemed to be the most common cause of complaints.

P.D.R. pages 10, 11.

DISEASES OF HERBACEOUS ORNAMENTALS

CHINA ASTER (Callistephus chinensis)

WILT (Fusarium conglutinans callistephi). Progress in the control of this disease, which was reported in 1929 from fourteen states scattered in all parts of the country, is reported by Jones and Riker (33). Promising resistant strains of all colors have been secured.

P.D.R. page 124.

YELLOWS (virus) continued to be very destructive. In Michigan it was estimated that half of the plants were affected, and cases of 100 per cent loss were observed. A loss of 25 per cent was reported for Kansas. In Oregon considerable trouble was experienced with a disease having symptoms similar to yellows. Jones and Riker (33) continued to obtain effective control by the use of cloth coverings.

P.D.R. pages 10, 124.

DAHLIA (Dahlia sp.)

BACTERIAL WILT (Bacterium solanacearum). This disease, which was first reported by Wolf (72) from North Carolina in 1922, was reported again from several localities in that State in 1929. Dozier (16) has written a short article on the disease and mentions having observed it in Delaware during the years 1927, 1928, 1929.

J. F. Adams reported a heavy infection in one planting in Delaware in 1927.

STUNT AND MOSAIC (virus). This group of diseases, the causes and symptomatology of which are not clearly defined, are becoming increasingly troublesome. In 1929 damage was reported to the Survey from the following states: Connecticut, Pennsylvania, New Jersey, Delaware and Indiana.

P. D. R. page 138.

GLADIOLUS (Gladiolus spp.)

STORAGE ROT (Penicillium gladioli). The cause of this storage rot was first determined in 1928 but previous to that time it had been widely observed both in the United States and in Canada. In 1929 it was reported as becoming a very serious trouble in Michigan in storage. In Indiana it was found abundant only in stock of growers who washed bulbs over a screen.

IRIS (Iris spp.)

NEMATODE (Tylenchus dipsaci) was found on bulbous Iris in Virginia by J. M. R. Adams. It was reported on Iris spp. from Pierce County, Washington.

P.D.R. page 28.

LEAF BLIGHT (Kabatiella microsticta) was reported as causing serious blighting of I. germanica in New Jersey, District of Columbia and New York City.

P.D.R. pages 43-44.

LEAF SPOT (Ascochyta iridis Oud.) on I. germanica, Washington, D. C.

P.D.R. page 109.

LEAF SPOT (Polyspora herbarum var. iridis). P.D.R. page 161.

ROOT KNOT (Caconema radicicola) P.D.R. page 175.

BASAL ROT (Sclerotium delphinii). Reported from New Jersey.

MOSAIC (virus). Reported from New Jersey.

MOSAIC OF BULBOUS IRIS. In a general survey of iris plantings on the Pacific Coast from Washington to California, early in 1929, Mr. Philip Brierley noted the general prevalence of a mosaic or yellow streak disease. The prevalence of mosaic greatly increased the farther south one traveled along the coast and in Southern California it was not uncommon to find stocks which had been in the country for five to six years infected 100 per cent. Iris stocks recently imported from Holland showed much less infection and sometimes none. A forcing test of different iris stocks with various percentages of mosaic showed a very depressing effect of mosaic on the number and quality of flowers produced. Information was given to us that some of the large buyers of iris for forcing purposes are now asking for a guarantee that the stock they purchase is free from mosaic. (Freeman Weiss)

LILY (Lilium spp.)

MOSAIC (virus) General in stock forced for Easter trade in New Jersey. From 2 per cent up to 18 per cent counted in various places. (R. P. White). Ogilvie and Guterman (47) have recently published a preliminary report of lily mosaic as observed in Bermuda and in greenhouses in the United States.

FOOT ROT (Phytophthora cactorum) was reported from Indiana and Maryland in the vicinity of the District of Columbia, on various species of Lilium.
P.D.R. page 8.

NARCISSUS (Narcissus spp.)

BASAL ROT (Fusarium sp.). The way for control of this disease, which causes great losses to stock and bulbs in storage, has recently been pointed out by Weiss (P.D.R. 13: 160) who recommends cold storage as a satisfactory and feasible method. Several workers have shown that the hot water treatment for nematode favors basal rot and the suggestion has therefore been made that a disinfectant, such as one of the mercuric compounds or formaldehyde, be added to the water.

BULB NEMATODE (Tylenchus dipsaci). During the year specimens of bulbs originating in the following states were examined in the Office of Nematology with positive results: Massachusetts, New York, Virginia, Florida, Ohio, Michigan. It was also found on cut flowers of poeticus ornatus from Canada intercepted at Detroit. Collaborators reported its occurrence in Washington and Oregon, but for Oregon the statement is made that it has been practically eradicated from commercial plantings.
P.D.R. page 9, 28.

MOSAIC OR GRAY DISEASE (virus) was reported in commercial plantings from Virginia, Michigan, Washington, and Oregon. Much difference in the susceptibility of varieties was noted. Apparently the growers are not practicing any control measures to eliminate or reduce it.
P.D.R. page 8.

PHLOX (Phlox spp.)

STEM NEMATODE (Tylenchus dipsaci) was first found on phlox in this country in 1923 in New Jersey. It was observed in California in 1924 but has not been seen there since. In 1928 it was noted in Connecticut. In 1929 it was reported from these two States and also from New York. In each instance the disease was destructive. In Europe the nematode has been reported on phlox from Belgium, Holland, Switzerland, and Germany. Lately the notes about this pest in central Europe have been becoming increasingly frequent.
P.D.R. pages 43, 60, 109.

SWEET PEA (Lathyrus odoratus)

CROWN GALL (Bacterium tumefaciens). One case was observed in a greenhouse in Atlantic County, New Jersey. The grower recalled first observing the condition five years ago. Since then it has gradually become more abundant so that the 1928-29 crop had about 80 per cent of plants with large fascicled outgrowths at base. Apparently it did not affect the growth nor the yield. (C. M. Haenseler).

TULIP (Tulipa spp.)

BREAKING (virus). In Oregon, where commercial bulb growing is on the increase, this is only rarely of much importance. In individual patches where stocks were not properly segregated and aphids were prevalent it was often noticeable, however. (M. B. McKay).

VIRGINIA BLUEBELLS (Mertensia virginica)

MOSAIC (virus). Whetzel and White (P.D.R. 44) reported the observation of a serious type of mosaic affecting 30 per cent of the plants in a New Jersey garden. This seems to be the first record of mosaic on this host.

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CORRECTION

Peronospora effusa (downy mildew) was erroneously reported as occurring on carrots in Indiana (Plant Dis. Rptr. Suppl. 68: 87. May 1, 1929). This fungus was reported on spinach from that State, which can be added to the others listed on page 92 (l.c.)